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Dr. Bazin has a long record of service with our Association: Honorary Treasurer 1923-1928; Managing Editor 1923-1930; President 1929; member of the Executive Committee 1923-1934; Chairman of Council 1932-1934; Chairman of Committee on Medical Services in Canada 1923-1940. He has had a long and intensely active life in private practice, teaching and hospital work. He was Professor of Surgery at McGill University from 1923-1938, retiring as Professor Emeritus, and from the year of his graduation (1894) has had an uninterrupted career of brilliant work, both professional and administrative, at the Montreal General Hospital, deeply influencing large numbers of pupils and associates.

It is in recognition of his lifelong and unwearying devotion to the highest professional ideals of medical service that Dr. Bazin is being granted the Frederic Newton Gisborne Starr Memorial Award.

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THE EARLY DIAGNOSIS OF SPINAL CORD LESIONS*

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SPINAL cord lesions are many and varied, and their early recognition is dependent upon the alertness of the physician. It is his responsibility to investigate the patient's first complaint of numbness, or limb weakness, or sphincter disturbance, or root pain. His persistence in eliciting the well-known physical signs of involvement of the cord or cauda equina is decisive at this point.

It may be profitable to discuss a few conditions which are important either because they are common, because they are easily missed, or because there are new ways of recognizing them. The problem of intervertebral disc protrusion, both of the cervical and of the lumbar region, is important on all counts and merits a few comments upon disc disease in general.

It was at first believed that all disc protrusions were due to trauma, thus the term "ruptured" intervertebral disc. Trauma, such as the lifting of a heavy weight, may precipitate symptoms. Most workers now feel, however, that many patients have suffered over a long period of time from a generalized softening and degeneration of disc tissues. This condition can often be demonstrated at many levels other than the one that is causing symptoms. In this light, disc disease can be looked upon as a collagen disease—a medical condition which may heal spontaneously or which in the future may be found to respond to some of the newer agents.

In many cases there is no history of trauma, and symptoms are due to swelling of the disc with consequent protrusion. The swelling may subside, or the protruding disc tissue may heal by the invasion of fibrous tissue and by partial retraction. Such healing processes explain the spontaneous recovery which often occurs after a brisk bout of sciatica, and further protrusion also explains the tendency to recurring attacks.

To aid early diagnosis, one can frequently obtain a history pointing to previous disc trouble—a former bout of lumbago or sciatica, a crick in the neck, neuritis in the arm. Furthermore, the healing process may leave unmistakable signs that can be seen in plain x-ray films. The ligaments which contain and hold back a softened, bulging disc are apt to become infiltrated with calcium. They then form osteophytes or bony spicules from the vertebral edges, or if the whole ligament is infiltrated, a bony bridge is formed.

These changes have long been called "osteoarthritis" of the spine, but at the Montreal Neurological Institute this term is no longer used to describe them. The process is *not* an involvement of synovial joints in the usual sense of the term. The changes seem to indicate previous intervertebral disc disease with an attempt at healing.

Most physicians now agree that most cases of low back pain with classical sciatica are due to intervertebral disc protrusion. We now realize that this may be true of the neck region too. Many ill assorted conditions that have gone by such names as "cervical arthritis", "fibrositis", "brachial neuritis", etc., are really due to cervical disc disease.

Lumbar disc protrusion can cause back pain alone, or sciatica, or both. The back pain and spasm appear to arise from ligamentous or vertebral structures at the site of protrusion and are intensified by deep pressure over the back or by movement of the spine such as bending. There is sometimes an area of marked hyperalgesia over the flank on the affected side, and the touch of a pin over that area may cause marked over-reaction and sudden contraction of the paraspinal muscles. This is a valuable clue that the pain is of intraspinal origin, for in the absence of sciatica, it could be mistaken for pain of renal or pelvic origin.

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When the disc has swollen more and protrudes further, there is apt to be compression of one of the nerve roots at the intervertebral foramen and sciatic pain is superadded—a picture with which all are familiar. It is important not to accept any pain in the leg as being sciatica, but only that with true radiation down the back of the buttock and thigh and on to the medial (L-5 root) or lateral (S-1 root) surface of the foot. Bizarre radiations, such as to the anterior thigh, are usually due to something else, or to the rare upper lumbar protrusions. Coughing or straining may intensify the sciatic pain, but one cough is not enough to test this. The patient must cough three or four times in succession to fill up the rachidien veins and put the nerve root on stretch.

The simple mechanical disc lesion can produce a bewildering variety of clinical pictures. Some patients have exquisite pain, whilst others have muscular weakness but little pain. Some have reflex changes such as an absent ankle jerk, others none. Sometimes the muscle weakness is in the calf, sometimes in the anterior tibial group. These can be tested by having the patient stand on the toes, and then upon the heel of the affected leg. Surprisingly enough, weakness of the extensor of the great toe may be the only sign of motor involvement. Such clinical symptoms are all-important for early diagnosis.

X-ray of the lumbo-sacral spine should be made in all cases, if only to rule out destructive disease of the vertebral bones. More often than not, there may be a large disc protrusion without any evidence in the x-ray picture. This is due to the fact that the soft disc tissue throws no contrast. In some cases, the infiltration of calcium, mentioned before, may outline the protrusion or may give evidence of disc disease elsewhere along the spine.

Myelography consists in the introduction of a radiopaque oil into the lumbar subarachnoid space. The oil is allowed to run up and down by tipping the patient. This procedure can show very vividly the filling-defect caused by a protruding disc. The technique has been much advanced by the use of pantopaque instead of lipiodol. The former is thinner and less viscid, and thus rolls up and down in a solid blob. It can also be removed more easily after the examination. Ten c.c. are introduced under fluoroscopic control, the needle is left in place during the procedure, and all but a few drops are withdrawn at the end of the test. This requires a certain skill, but it is an advantage not to have the oil spread permanently about the meninges as in older days.

Myelography is not usually used for the diagnosis of disc protrusion, which can often be determined on clinical grounds. It is obvious that to do a myelogram upon a patient in his first acute attack of sciatica, when only conservative therapy is envisaged, is a matter of mere scientific curiosity. The protruded disc may heal and retract by itself. It is only when surgical intervention is indicated that a myelogram is done. This is to guide the surgeon and to determine what other protrusions may be present, even if they are not causing symptoms.

Cervical disc lesions present difficulties but the diagnostic problems are much the same as with lumbar discs. Surgical treatment in these cases is a much more formidable affair however, since the cervical cord lies very deep beneath the tissues and damage to it could be ruinous. The skilled neurosurgeon can, nevertheless, deal with these cases. Fortunately many of these patients can be treated conservatively with great relief.

If the disc protrusion involves only the ligamentous and vertebral structures, neck pain and stiffness may be the only clue, just as low back pain may be the only symptom with a lumbar disc. Further protrusion laterally may compress the nerve root and give pain in the arm and elsewhere, or if the protrusion is in the mid-line, it may compress the spinal cord and give rise to paraplegia and the signs of a spinal cord tumour. Cervical discs that cause nerve root symptoms usually occur at the C-5 to C-6 and C-6 to C-7 levels, with resulting pain in the arm. This is not so well defined, however, as is sciatic pain in the leg, and the patient may not be able to say whether it is in the radial or ulnar side. Sometimes the pain is in the shoulder region and is mislabelled "sub-acromial bursitis". In other well authenticated instances it is referred to the precordium and is misinterpreted as heart pain.

To avoid mistakes the cervical disc syndrome must be kept constantly in mind. Tenderness and spasm of muscles in the neck must be sought for, and appropriate tests must be made of sensibility, motor power and reflexes in the

arms. Pain in the shoulder, when there is no limitation of movement of that joint, should always evoke the suspicion of cervical disc protrusion. Central disc protrusions require particular emphasis. For some reason or other, compression of the spinal cord in the upper cervical region may give rise to little local pain without sensory impairment. This masquerade leads the clinician to believe that there is a degenerative cord condition such as multiple sclerosis or primary lateral sclerosis, whereas a mechanical and remediable lesion is actually present. More and more instances of this have been reported in the past few years. In these cases, careful manometric and chemical studies of the cerebrospinal fluid, and the employment of contrast myelography are mandatory.

Abnormalities around the foramen magnum.— These conditions of varying causation tend to compress the medulla or to disturb the blood supply of the cervical cord in the region of the foramen magnum. They give rise to similar symptoms which we dignify as the foramen magnum syndrome. A detailed description will not be given here. The causes include platybasia, where the base of the skull is partly pushed up or invaginated into the cranial cavity; the Arnold-Chiari malformation, and a variety of congenital bony abnormalities around the foramen magnum. They are important because they give rise to a picture of slowly progressive degeneration of the spinal cord, whereas the only prospect of relief lies in their correction by surgical means.

These patients, over a period of months or years, develop increasing stiffness and incoordination of the lower limbs with progressive difficulty in walking. Pain in the neck or sensory changes below the lesion may not be present, and the signs are those of a spastic paraplegia. Careful examination may reveal a little difficulty in swallowing, slight wasting of the tongue, hearing defect, or some other indication that the brain stem is being displaced and the lower cranial nerves embarrassed.

Why these lesions, many of which are congenital, should only begin to cause symptoms in later life is hard to understand. This is true of many congenital lesions, however, *e.g.*, cervical rib, and it may be due to gradual change in the structural relationships with age.

Stereoscopic x-ray films of the cervical spine and foramen magnum should be made in all these cases. They may give the first lead to the true condition. Needless to say, a skilled neuroradiologist, who is familiar with the delicate interrelationships in this area, is an invaluable aid.

Even if no structural abnormalities appear in the plain roentgenograms, this region should then be examined by myelography. For this purpose it is our custom to employ air introduced by the lumbar route. Air is of little use for myelography elsewhere, but in the region of the upper cervical cord and the cisterna magna, it outlines the structures well. This technique obviates the unpleasant splattering about of contrast oil in the basal cisterns and meninges, which is apt to occur when lipiodol or pantopaque is used.

Electromyography consists in the stepping-up of muscle action currents or abnormal potentials so that they can be recorded and studied. A small, insulated hypodermic needle is placed into the muscle and the potentials are led off to an amplifier and recorded upon a cathode ray screen or heard over a loud speaker. A skilled observer is able to distinguish between normal willed movement, spasm, and the large fasciculations which may occur with motor neuron disease and which are wrongly referred to in our textbooks as fibrillations.

More important is that this method is capable of picking up slight degrees of denervation of a muscle like that produced by gradual damage to anterior horn cells in the cord. Denervation invariably causes fine fibrillations to appear in the affected fibres, of a degree imperceptible to the eye through the human integument. It is readily identified in the electromyogram, however, and thus may contribute to early diagnosis and even to prognosis, since fibrillation disappears when re-innervation occurs.

Conclusion

There are a number of new techniques that aid us greatly in the early diagnosis of spinal cord lesions. It is, however, the early clinical analysis which leads to the suspicion of a cord lesion and which points to the use of these newer methods. All of us must keep our "index of suspicion" high when dealing with such cases in order that treatment may be instituted before irreparable damage has been done.

LE DIAGNOSTIC PRECOCE DES LESIONS DE LA MŒLLE EPINIERE*

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LES lésions de la mœlle épinière sont nombreuses et variées, et seul le médecin averti peut en faire le diagnostic précoce. C'est à lui qu'il revient de rechercher chez le malade le premier signe d'engourdissement, de faiblesse musculaire, de trouble sphinctérien ou de douleur de type radiculaire. C'est à ce stage qu'il importe surtout de relever les signes physiques bien connus attestant d'une atteinte de la mœlle épinière ou de la queue de cheval.

Certains de ces symptômes valent la peine qu'on s'y arrête, soit à cause de leurs caractères communs, soit parce qu'on peut facilement passer à côté ou qu'il existe de nouveaux moyens de les reconnaître. Qu'elle intéresse la région cervicale ou lombaire, la hernie des disques intervertébraux mérite d'être étudiée sous tous ses aspects, en plus de commentaires sur la maladie discale en général.

Le traumatisme fut tout d'abord impliqué à l'origine de toutes les hernies discales, d'où le terme de "hernie" de disque intervertébral. En fait le traumatisme, tel que l'action de soulever un poids lourd, peut hâter les symptômes.

C'est l'opinion de la plupart des chercheurs, cependant, que nombre de malades présentaient déjà depuis longtemps un ramollissement et une dégénérescence du tissu discal même et ce à maints degrés autres que celui qui provoque des symptômes. Envisagée de cette façon la maladie discale peut être considérée comme une maladie des tissus collagènes—une affection médicale qui peut guérir soit d'elle-même soit tôt ou tard par l'emploi des thérapeutiques les plus modernes.

Dans un bon nombre de cas il n'y a pas d'histoire de traumatisme, et les symptômes sont causés par le gonflement du disque puis sa herniation. Il peut arriver que le gonflement s'amende, ou que le disque hernié guérisse par développement de tissu fibreux et rétraction partielle. C'est ainsi que s'explique la guérison spontanée qui survient après une forte attaque de sciatique, de même qu'une herniation plus avancée rend compte d'une tendance à des crises récurrentes.

Pour faciliter un diagnostic précoce, on peut souvent relever dans les antécédents du malade un syndrôme discal antérieur—une vieille crise de lumbago ou de sciatique, un torticolis, une névrite brachiale. Des radiographies ordinaires peuvent également faire voir des signes évidents d'un processus de guérison. Les ligaments qui retiennent en place un disque ramolli et bombé ont une tendance à s'infiltrer de calcium; ils forment alors des ostéophytes ou des arêtes osseuses sur les rebords vertébraux, ou enfin un pont osseux si l'infiltration gagne le ligament tout entier.

Depuis longtemps on désigne ces altérations sous le nom d'"ostéoarthrite" de la colonne vertébrale, un terme qui n'est plus en usage à l'Institut Neurologique de Montréal. Le processus ne comporte *pas* une atteinte des synoviales dans l'acception ordinaire du terme; il paraît plutôt indiquer une maladie antérieure d'un disque intervertébral qui aurait eu des velléités de guérison.

La plupart des médecins se rangent maintenant de l'avis que presque tous les cas de douleur lombaire basse avec sciatique classique sont causés par une herniation des disques intervertébraux. Tel semble aussi être maintenant le cas pour la région cervicale. Des affections disparates que l'on désignait sous les termes de "arthrite cervicale", "fibrosite", "névrite brachiale", etc., relèvent en réalité du syndrôme discal cervical.

La hernie du *disque lombaire* peut causer la douleur lombaire seule, ou la sciatique, ou les deux. La douleur lombaire et le spasme semblent originer des ligaments ou des vertèbres au point d'herniation et elles sont intensifiées par la pression profonde ou par les mouvements de la colonne tels que l'acte de se pencher. On note parfois une zône d'hyperalgésie sur le flanc du côté de la lésion, le contact d'une épingle y causant une forte réaction ainsi qu'une contraction soudaine des muscles paravertébraux, un indice important que la douleur est d'origine intervertébrale, car en l'absence de sciatique on pourrait la confondre avec une douleur d'origine ou pelvienne.

Quand le disque augmente davantage de volume et s'hernie plus avant, il y a risque de compression de l'une des racines nerveuses au trou de conjugaison et la douleur sciatique se

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Lu à la 81ème Assemblée Annuelle de l'Association Médicale Canadienne, juin, 1950.

surajoute—un tableau qui est bien connu de tous. Il importe de ne pas considérer d'origine sciatique une douleur quelconque dans la jambe, mais seulement celle qui s'irradie vraiment le long de la fesse et de la cuisse jusqu'à la surface médiane (racine L-5) ou latérale (racine S-1) du pied. Des irradiations inusitées, comme à la partie antérieure de la cuisse, relèvent ordinairement d'herniations lombaires hautes qui sont rares, ou reconnaissent d'autres causes. L'effort ou la toux peuvent exacerber la douleur sciatique, mais il faut alors que le malade tousse non pas une seule fois mais trois ou quatre fois de suite afin de remplir les veines rachidiennes et tendre le nerf sciatique.

La simple lésion mécanique d'un disque peut donner un symptomatologie dont la variété est déconcertante. Certains malades ressentent des douleurs atroces, d'autres de la faiblesse musculaire mais peu de douleur. D'aucuns présentent des altérations de leurs réflexes telles que l'absence du réflexe achilléen, d'autres non. La faiblesse musculaire, intéresse parfois le mollet, parfois le groupe tibial antérieur; on en fait la distinction en demandant au malade de se tenir sur la pointe des pieds puis sur le talon de la jambe malade, et fait assez étonnant, le seul trouble moteur visible peut n'être qu'une faiblesse de l'extenseur du gros orteil. De tels signes cliniques revêtent une importance primordiale pour le diagnostic précoce.

Une *radiographie* de la colonne lombo-sacrée devrait être faite dans tous les cas, quand cela ne serait que pour éliminer les lésions osseuses destructives des vertèbres. Parce que le tissu discal mou ne projète pas d'ombre il arrive plus souvent qu'autrement que la radiographie ne met pas en évidence une herniation même considérable d'un disque. Dans certains cas, l'infiltration de calcium, dont il a déjà été question, peut dessiner les contours du disque ou en trahir la présence ailleurs le long de la colonne vertébrale.

La myélographie consiste à introduire une huile opaque aux rayons X dans l'espace sous-arachnoïdien lombaire. L'huile monte et descend suivant les mouvements de bascule imprimés au patient, et l'on fait ressortir ainsi de façon saisissante l'image d'encoche indiquant un disque hernié. La technique a été considérablement améliorée depuis que l'on a remplacé le lipiodol par le pantopaque; celui-ci est plus clair et moins visqueux, se meut en haut et en bas en une coulée non interrompue. L'examen fait on peut aussi le retirer plus facilement. 10 cm^3 sont introduits sous contrôle fluoroscopique, l'aiguille est laissée en place durant l'examen, après quoi toute l'huile est retirée à l'exception de quelques gouttes. Cette technique demande une certaine habileté, mais elle comporte cet avantage de ne pas laisser comme auparavant des épanchements durables d'huile autour des méninges.

On n'a pas recours d'ordinaire à la myélographie pour le diagnostic de hernie discale, que les signes cliniques seuls peuvent mettre en évidence. S'il n'est pas question d'intervenir chirurgicalement, c'est faire montre de pure curiosité scientifique que de pratiquer une myélographie sur un malade qui en est à sa première crise aiguë de sciatique. Le disque hernié peut guérir et rentrer en place de lui-même. Seule l'intervention chirurgicale en pose l'indication, pour guider le chirurgien et établir la présence possible d'autres herniations, même si elles sont asymptomatiques.

Le diagnostic de hernie de disque cervical, bien que difficile, présente les mêmes problèmes que celui du disque lombaire. Du fait cependant que la mœlle cervicale est profondément située dans les tissus et que son avarie serait désastreuse, l'intervention chirurgicale dans ces cas en fait une entreprise redoutable, à laisser entre les mains d'un neuro-chirurgien expérimenté. Heureusement le traitement conservateur peut améliorer grandement ces malades.

Si la hernie discale ne fait qu'intéresser les ligaments et la substance osseuse vertébrale, la douleur cervicale et la raideur peuvent en être les seuls signes, ainsi qu'il en est de la douleur lombaire basse dans le disque lombaire. Vient-elle à se hernier davantage latéralement il peut se faire une compression de la racine nerveuse avec douleur dans le bras et ailleurs, ou dans le cas de herniation médiane, la compression intéresse alors la mœlle épinière en donnant les symptômes d'une tumeur de cet organe avec paraplégie. C'est habituellement au niveau des C-5 à C-6 et des C-5 à C-7 que les disques cervicaux donnent des signes de compression radiculaire, mis en évidence par une douleur dans le bras. Celle-ci n'a pas les caractères aussi bien définis que la douleur sciatique dans la jambe, et le malade ne peut souvent dire si elle est du côté radial ou cubital. Elle est parfois ressentie dans l'épaule, et passe pour une "bur-

site sous-acromiale''; s'irradiant d'autre part dans l'aire précordiale elle peut en imposer réellement pour une cardialgie.

On évitera ces erreurs en songeant toujours au syndrôme de disque cervical. Il importe de rechercher la sensibilité et le spasme musculaire dans le cou, de même que la présence de troubles sensoriels et moteurs ainsi que l'état des réflexes dans les bras. Une douleur dans l'épaule, non accompagnée de limitation de mouvements, doit toujours faire soupçonner une hernie de disque cervical. On portera une attention toute particulière aux herniations centrales. Pour une raison ou pour une autre, la compression de la mœlle épinière dans la région cervicale haute cause peu de douleur locale sans altération sensorielle. Ainsi déguisée elle peut porter le clinicien à croire qu'il existe une dégénérescence de la mœlle comme on en rencontre dans la sclérose disséminée ou dans la sclérose latérale primitive, alors qu'on est en face ici d'une lésion mécanique et curable. Dans des cas de cette nature dont on a rapporté un nombre croissant au cours des dernières années, il est essentiel de faire une étude soignée de la pression et de la composition chimique du liquide céphalo-rachidien, ainsi que de recourir à la myélographie.

Anomalies autour du trou occipital.—Ces anomalies tenant à des causes variées ont pour effet de comprimer la mœlle cervicale ou d'entraver le débit sanguin dans la région du trou occipital. Aux symptômes semblables à qui elles donnent naissance on donne le terme de syndrôme du trou occipital, mais on n'en fera pas la description ici. Parmi ses causes citons la platybasie, une invagination de la base du crâne dans la cavité cranienne, la malformation d'Arnold-Chiari, et d'autres anomalies osseuses congénitales au pourtour du trou occipital. Leur importance tient au fait qu'elles amènent une dégénérescence graduellement progressive de la mœlle épinière, et il ne saurait être question de soulager le malade qu'en intervenant chirurgicalement.

Après des mois ou des années ces malades en arrivent peu à peu à présenter des troubles de la locomotion avec raideur et incoordination de leurs membres inférieurs. Il peut ne pas exister de douleur cervicale ni d'altérations sensorielles au-dessous de la lésion, et les symptômes sont ceux d'une paraplégie spasmodique. On note à l'examen un léger degré de dysphagie et d'atrophie de la langue, une audition diminuée, ou quelque autre signe que le pédoncule cérébral est en voie de se déplacer avec compression des nerfs crâniens inférieurs.

On ne comprend pas très bien comment ces lésions, congénitales pour la plupart, peuvent se manifester aussi tardivement, mais il en est de même de nombre de lésions congénitales d'ailleurs, comme par exemple la côte cervicale, et cela peut s'expliquer par les altérations osseuses progressives qui marchent de pair avec l'âge.

Il importe de faire alors en ce cas un examen stéréoscopique de la colonne vertébrale et du trou occipital, seul moyen de faire un diagnostic de cette affection. Il va sans dire qu'on fera bien de se prévaloir des services éclairés d'un expert en neuro-radiologie, pour lequel l'anatomo-physiologie complexe de cette région n'a plus de secrets.

Une myélographie y sera pratiquée, même si la radiographie simple ne montre pas d'anomalies structurales. A cette fin nous nous servons habituellement d'injections d'air par la voie lombaire. Peu utile dans les myélographies pratiquées ailleurs, l'air sert à bien dessiner les contours dans la région de la mœlle cervicale haute et de la grande citerne. On obvie ainsi au clapotement désagréable de l'huile, pantopaque ou lipiodol, dans les méninges et les citernes de la base.

Par *électromyographie* il faut entendre l'amplification des courants de contraction musculaire ou des potentiels anormaux faite de façon à les enregistrer et à les étudier. Une petite aiguille hypodermique isolée est logée dans le muscle et les potentiels sont dirigés vers un amplificateur puis enregistrés sur un cathodographe ou entendus à travers un haut-parleur. Un observateur entraîné peut distinguer entre le mouvement normal volontaire, le spasme et les grandes fasciculations indiquant une atteinte du neurone moteur, celles-là même que nos manuels désignent sous le terme inexact de fibrillations.

Cette technique présente un autre avantage plus important encore, celui de déceler à ses moindres degrés la perte d'innervation d'un muscle semblable à celle qu'entraîne une lésion progressive des cellules des cornes antérieures de la mœlle. La perte d'innervation a invariablement pour effet de déclancher dans les fibres musculaires atteintes de légères fibrillations imperceptibles à l'œil à la surface des téguments. L'électromyélogramme les identifie assez bien

cependant, contribuant ainsi à en faire le diagnostic précoce et même le pronostic, étant donné que la fibrillation cesse dès que réapparaît l'innervation.

CONCLUSION

Il y a un certain nombre de techniques nouvelles qui nous aident beaucoup dans le diagnostic précoce des lésions de la mœlle épinière. Toutefois ce sont les signes classiques du début qui permettent de soupçonner une lésion de la mœlle et commandent l'emploi de ces méthodes. En présence de cas de cette nature nous devons tous nous montrer particulièrement méfiants et circonspects et intervenir avant qu'il ne se produise des avaries irréparables.

HYPERTENSION—A PROBLEM OF GROWING IMPORTANCE*

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STUDY of vital statistics shows that cardiovascular disease is by many times the commonest cause of death today (Fig. 1). Of these deaths, the most common cause is related directly or indirectly to hypertension.

This situation has arisen, at least partially, as the result of two factors: First, the increasing average expectancy of life, and second, the introduction of the sphygmomanometer and the electrocardiograph to wide application in clinical practice.

Increasing longevity is mainly attributable to the influence of medicine in its broadest sense upon the community. There has been a reduction in the incidence of lethal communicable disease. More recently, specifics, whose horizon is rapidly expanding, have reduced the mortality of bacterial infection. More people escape or survive tuberculosis, typhoid, smallpox and pneumonia, to develop degenerative disease later in life (Fig. 2).

Dr. Harvey Cushing,[1] dead but a decade, introduced the sphygmomanometer to clinical practice on this continent. Dr. J. B. Herrick[2] brought the possibility of clinical diagnosis of coronary thrombosis to the attention of Anglo-Saxon clinicians in 1912. It is of interest that Osler's "Principles and Practice of Medicine" of 1902,[3] makes no reference to hypertension in the index.

Therefore our clinical observation covers a span of 40 years. The investigative efforts have been prodigious, if not fruitful in proportion. The contributions of Allbutt[4] and Janeway[5] are classical today, as studies of the complications of hypertension. During this same period of time, the life expectancy of man has risen more than a decade.

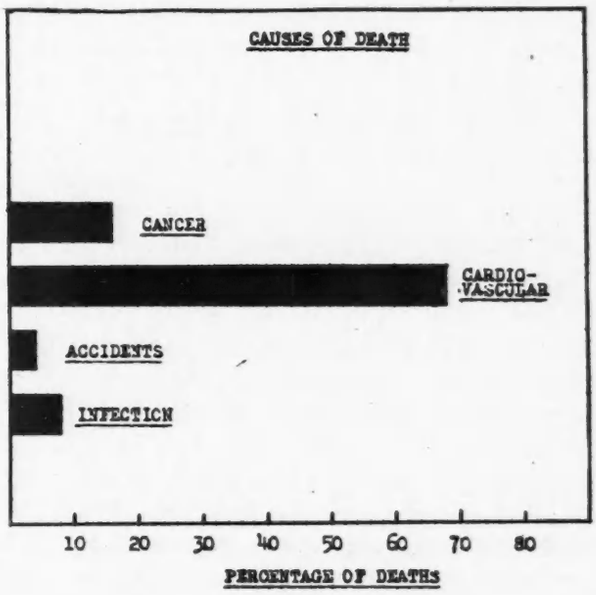

Fig. 1

Hypertension may result from various disorders. Renal disease, adrenal and pituitary tumours, increased intracranial pressure, asphyxia, elevate both systolic and diastolic pressures. Anæmia, hyperthyroidism, bradycardia, aortic insufficiency, arteriovenous aneurysm, cause systolic but not diastolic hypertension. Aortic coarctation causes regional hypertension.

Most cases of diastolic hypertension are of unknown etiology. The common benign form is seen in older individuals with large vessel sclerosis. It is characterized by a moderate to marked systolic elevation, but mild or absent diastolic hypertension. Symptoms are related to complications in the cardiac, cerebral or renal systems. With increasing frequency today, symptoms result from fear of known hypertension or from over-zealous therapy. My growing conviction is that this patient might enjoy better health in ignorance of the

* Paper presented at the Canadian Medical Association, Halifax, June, 1950.

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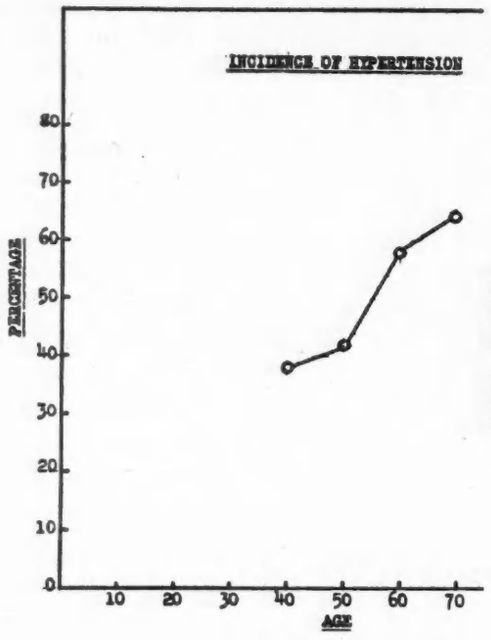

Fig. 2

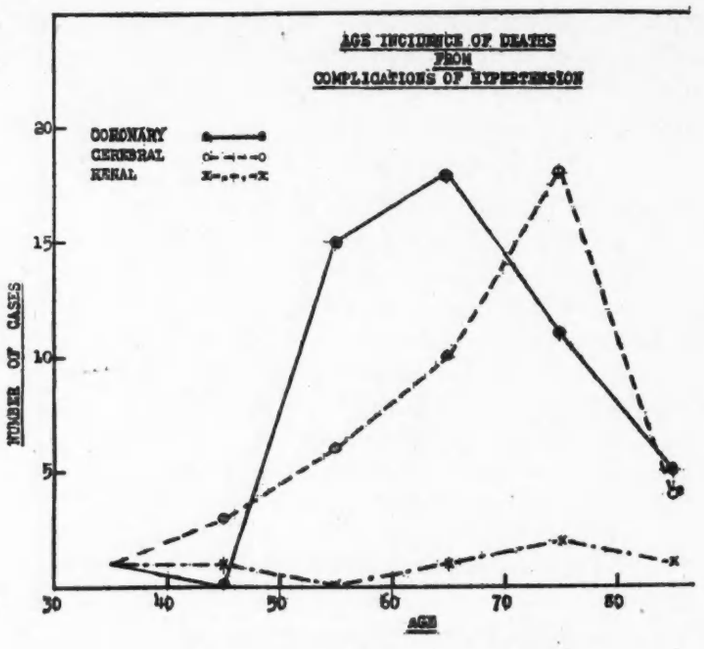

Fig. 3

existence of his hypertension. Modification of the daily round of activity, commensurate with age, may spare some patients apprehension and the discomfort of dietary deprivation, whose worth remains unproved. It is true that this type of hypertension terminates fatally through complications in some 70% of victims. It permits of survival to the Biblical three-score and ten. In general, the prognosis, where the diagnosis is made under the age of 50, is of 15 years' survival. Over the age of 50, the prognosis remains good. However, if the diastolic blood pressure is 120 mm. of mercury or more, the prognosis is at best halved. Therapy has not proved effective in postponing the onset of complications. Death occurs as the result of cardiac complications in approximately 70%; cerebral in 20% and renal in 10%.

Of different character and of less common incidence, is malignant hypertension. Eclampsia and intercapillary glomerulosclerosis are examples; perhaps of different etiology, but of similar clinical characteristics. This fulminating hypertension arises in younger individuals, with or without known preceding hypertension. Headache and ocular symptoms bring these patients to their physicians. Renal and cardiac complications are fatal in less than two years in the experience of Keith[6] and associates at the Mayo Clinic. Malignant hypertension is receiving much investigative attention. Surgical attempts at therapy have resulted in clinical recognition of adrenal tumours as causal in perhaps 1%. Present day treatment of this type of hypertension is at best disappointing. The experience of my associates and myself with thiocyanate therapy has been quite as satisfactory as the reported results of surgery by the late Dr. Peet,[7] and his group. The rice diet is impracticable in our experience in Western Ontario. Less than 10% of patients conscientiously follow extreme salt-restriction after discharge from hospital. We hope to accumulate experience with the exchange resins, which block absorption of sodium from the alimentary canal. Restriction of salt is of proved benefit in the presence of congestive heart failure. Evidence is suggestive, but not conclusive, that salt-restriction may be of value in the asymptomatic, uncomplicated malignant hypertension.

At Westminster Hospital, in the past year 175 hypertensives have been observed, with 26 deaths. Of this group, 33 were under the age of 50 years. In many of these patients, hypertension was not the cause for admission to hospital. My colleagues and I feel that hypertension may be much commoner in this younger age group than has been previously recognized. That it is usually a benign disease, is indicated by the increasing life expectancy of the general population.

Reference must be made briefly to various fundamental approaches to this problem. We

must acknowledge the unsatisfactory state of our knowledge and continue, and increase our investigations.

Dr. Goldbatt[8] and his group, by the use of an ingenious clamp on the renal artery, succeeded in inducing both the benign and the malignant forms of hypertension in the dog. This work has been expanded and from it has arisen a humoral theory to explain hypertension. Attempts to apply these results in man have not been encouraging. In the clinics of Page and Houssay, investigations along these lines continue. The psychiatrist has offered an explanation on the basis of emotional tension in the presence of an hereditary neurogenic background. The susceptible group is said to show a high incidence of subnormal assertiveness. It is established that emotional tension causes profound alteration of the circulation through mediation of the sympathetic nervous system and the kidneys. This theory is similar in principle to that enunciated by Dr. Selye[9] under the general term of the adaptation syndrome. The clinical correlation of mental stress to elevation of blood pressure, is a common observation. In the opinion of Fishberg, (which I share) the solution to the problem of hypertension is not likely to be found in the field of psychotherapeutics.

It has been taught for generations, that our price of civilization is hypertension and vascular degeneration through "wear and tear". Alleged support for this statement was to be found in the low incidence of hypertension in the Chinese and in the native African, and the high incidence of hypertension in the American negro. I have been unable to find statistical proof; in that the life expectancy of the African negro in the jungle, is unknown to me. In a most important communication to the American College of Physicians, Suarez[10] in a careful study of the native population of Puerto Rico, subsisting largely on a rice diet, found the incidence of hypertension, by age groups in the native population, to be approximately that of the continental United States.

A potential reservoir from which hypertensives are recruited, must exist. The study of Levy, Stroud, White and Hillman[11] within the past decade, suggests that the findings of transient hypertension must be regarded with suspicion. This group contributes many more cardiovascular deaths than does the group not showing this tendency. The cold pressor test of Hines[12] may reveal a further group with vascular vulnerability. My associates and I are participating in a group study being conducted by the Department of Veterans' Affairs to explore the numerical importance of this group in the overall picture of hypertension.

From our own experience, studying 205 cases, we may offer some therapeutic suggestions. First, that the discovery of hypertension of mild to moderate degree, is of itself of little immediate clinical significance. Symptoms, such as unwonted exertional dyspnœa, represent cardiac; nocturia or polyuria, renal; vertigo or transient pareses, cerebral complications of the disease.

Of 118 cases observed in our clinic, for less than five years, 50 show exertional dyspnœa and only 43 are asymptomatic. In this group of 50 cases, reduction of salt intake may control breathlessness. Failing that, digitalization is carried out. The appearance of lung moisture necessitates the use of a mercurial diuretic. In our hands, thiomerin given subcutaneously has the advantage of simplicity and of less sudden and enervating diuresis. At this phase, weekly or at most bi-weekly injections are required to control this minimal left ventricular failure. In this group observed less than five years, the occurrence of myocardial infarction in 13 patients, makes clear the necessity for regulating the individual's activities to the proportion of his years.

Although our experience has not been analyzed in this direction, insurance statistics indicate significant shortening of life where weight is in excess of 15% above "ideal". Therefore weight reduction in the obese, gradually accomplished, contributes to comfort, well-being and longevity. The high protein diet, recently suggested to procure this "slimming", is probably not ideal in the hypertensive.

Symptoms of anxiety or frustration must not be aggravated by the unjustified use of thiocyanates in this group. Treatment must consist in the assistance to resolve domestic or business preoccupation. The judicious use of barbiturate sedation, without the added expense of rutin, may be required during this period of indoctrination into the hypertensive existence. In our hands, the nitrites have so frequently produced dizziness or syncope, that we have used them sparingly. No contraindication exists to the use of barbiturates intermittently or continuously,

for months or years, if necessary to maintain a philosophic calm.

As anticipated from the experience of others, a "peak" of deaths occurred in the ten to fifteen year group (Fig. 3). This is added evidence of the benign nature of the majority of hypertension. Fourteen cases survived twenty years or longer. Of these, four have died, all of cerebro-vascular accident. One non-fatal myocardial infarction has occurred. All patients surviving this length of time, suffer from congestive failure in this series. The importance of attentive cardiac therapy needs only to be mentioned.

Malignant hypertension occurring before the age of forty years, must be intensively studied to detect remediable defects. Such would include certain urological disorders, pyelonephritis or adrenal tumour. This presentation will not deal with the place for surgical therapy in this group. It is here that the use of carefully-controlled thiocyanate therapy is applicable. This is particularly true in the presence of severe headache. In an unreported study conducted in this hospital,[13] administration of thiocyanate resulted in significant subjective improvement in 65% of patients. Our impression is that the prognosis suggested by Keith[6] and associates, for this group of patients, is over-pessimistic.

SUMMARY

1. Vascular hypertension is the commonest cause of death at the present time.

2. The etiology in the majority of instances remains unknown.

3. The course of the disease is, in the main, chronic and compatible with full life expectancy. The prognosis is not without uncertainty in the individual case.

4. Supervention or appearance of malignant hypertension, alters the prognosis unfavourably.

5. Too little is known of the life history of the disease.

6. Observations of this nature are in the progress of collection in this country.

Preliminary analysis of our experience with hypertension, was carried out by Dr. W. J. M. Cameron, visiting physician to Westminster Hospital. The studies on thiocyanate therapy were conducted with the collaboration of Dr. C. Y. Brown, one time senior resident in Medicine, Westminster Hospital. It is a pleasure to acknowledge the assistance of the Records Librarian, the Photographic Department, my colleagues in the Cardiac Division and Dr. C. M. McLeod, Hospital Superintendent.

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RÉSUMÉ

L'hypertension artérielle est de nos jours reconnue comme la cause la plus commune, directement ou indirectement, des décès imputables aux maladies cardio-vasculaires. Dans la plupart des cas l'étiologie en est inconnue. La forme bénigne commune se rencontre chez les sujets âgés avec sclérose importante de leurs vaisseaux, et les symptômes sont ceux des complications survenant dans les systèmes cardiaque, cérébral et rénal; ils naissent aussi souvent de la crainte de la maladie elle-même ou d'une thérapie trop entreprenante. Dans 75% des cas les complications emportent les malades. Survenant après 50 ans cependant, le pronostic s'améliore.

Différente et plus rare est l'hypertension maligne, comme celle de l'éclampsie et la glomérulosclérose intercapillaire, affectant des sujects moins âgés avec ou sans troubles antérieurs. Son traitement s'est avéré peu efficace, cependant l'auteur a employé avec d'assez bons résultats le thiocyanate, associé au régime déchloruré.

Pour expliquer l'hypertension les psychiâtres invoquent une tension émotive élevée chez des sujets prédisposés héréditairement, laquelle tension cause une altération profonde de la circulation par le système nerveux sympathique, un état analogue au syndrôme d'adaptation du Dr Selye. Cependant l'auteur ne croit pas que la solution du problème de l'hypertension soit du ressort du psychothérapeute. Il en est de même de l'usure imputable à la civilisation avancée, qui se semble pas confirmée par les faits.

Un obèse hypertendu dont le poids dépasse 15% de la normale prolongera son existence par un régime approprié, mais la diète élevée en protéines ne lui conviendrait guère. Enfin, dans l'hypertension maligne, l'emploi de thiocyanate, déjà mentionné, a donné à l'auteur des améliorations importantes chez 65% de ses patients.

PENICILLIN, AN ALLERGIC HAZARD.—The increase of reactions from penicillin is as real as it is apparent; and the gravity of the reactions is increasing. The familiar urticaria which formerly amounted to little more than cutaneous discomfort is now being replaced in many instances by reactions more profound; reactions that simulate the serum sickness of former days and suggest that an anaphylactoid phenomenon with all its portents has made its appearance. To explain this on the grounds of the complex protein of the mould substance, or to a lessened sensitivity on the part of the infections treated is tempting. However, in view of the widened and indiscriminate use of penicillin one must concede the guilt of usage rather than substance.—Robert L. Gilman, *U.S. Armed Forces Med. J.*, **1**: 1155, 1950.

BRONCHOSCOPY IN THE DIAGNOSIS AND TREATMENT OF LUNG DISEASE*

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BRONCHOSCOPY, which was first performed forty to fifty years ago, has made great advances in the past few decades. It was originally developed by otolaryngologists for the removal of foreign bodies from the air passages and the observations made by the pioneers in this field added much useful information to our knowledge of the physiology of the trachea and bronchi. Gradually its scope has widened until now it is employed as a diagnostic aid and a method of treatment in practically all diseases which affect, directly or indirectly, the tracheobronchial tree. From this has developed a special branch of medicine known as bronchology. This specialty is usually combined with the study of diseases of the œsophagus and hence the combined term broncho-œsophagology.

Bronchoscopy has become such a useful aid in chest diseases that in many centres it is no longer centralized under one department of medicine. It is now becoming part of the education of the thoracic surgeon, the phthisiologist and the anæsthesiologist. Except in the large centres too much subdivision of the work will mean that no one person will obtain sufficient experience to qualify him as a competent operator or maintain the skill of one already so qualified.

In those hospitals where the number of cases to be examined and treated by bronchoscopy is limited, the otolaryngologist is the person who should be the well-trained broncho-œsophagologist. In order to do this he must have not only very adequate training in the technique but also must have an accurate appreciation of lung diseases. He must also be prepared to do bronchoscopy in the tuberculosis sanitaria as this has now become a necessary procedure in many of these cases.

What are the contraindications to bronchoscopy? In the presence of a bronchial foreign body there are practically no contraindications. On the other hand when bronchoscopy is undertaken as an elective operation, the general state of the patient should be fully assessed. Jackson[1] states:

> "Contraindications to bronchoscopy in disease do not exist if the bronchoscopy is really needed. Serious organic disease such as aneurysm, hypertension, or advanced cardiac disease might render bronchoscopy inadvisable except for the removal of foreign bodies."

Hæmoptysis unless it is caused by a foreign body, should be investigated bronchoscopically only after a 7 to 10 day period. Such a delay should occasion no great delay in diagnosis since other examinations, laboratory tests, etc., can be carried out during the waiting period. Acute respiratory infection is an indication for postponement except in certain foreign body cases. To quote Myerson[2] "Bronchoscopy should not be performed in certain cases of active pulmonary tuberculosis". It would appear therefore that definite contraindications to bronchoscopy are few in number. Clerf[3] adds two important ones, namely, an inadequate armamentarium and a poorly trained bronchologist.

It would be impossible in a paper of this length to present in any detail the numerous individual indications for bronchoscopy. Holinger[4] divides them into three general headings, namely, (1) bronchial obstruction; (2) pulmonary suppuration; and (3) obscure pulmonary disease requiring further diagnostic study. To these headings will be added a short discussion on the problem of bronchoscopy in tuberculous tracheobronchitis. As practically all the endoscopic work in our clinic is now done on adults I will not attempt to discuss bronchoscopy in children except to mention one case of vegetable foreign body.

OBSTRUCTIVE LESIONS

Foreign bodies.—Although bronchoscopy was originally developed for the removal of foreign bodies this aspect, especially in adults, has become overshadowed by its many other uses. At present only about 2% of all bronchoscopic procedures are performed for the removal of foreign bodies. Age is an important etiologic factor, as shown by the fact that approximately 80% of patients with foreign bodies are under 15 years of age. The initial symptoms of an inhaled foreign body are characterized by a sudden onset of choking, gagging, coughing, and wheezing. As pointed out by Jackson[1] and others, this is frequently followed by a symptomless interval. In any case in which the

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above symptoms occur, an x-ray study is indicated and if a foreign body is demonstrated it should, of course, be removed. The presence of x-ray and clinical signs of pneumonitis, unilateral emphysema, atelectasis, etc., may also indicate a non-opaque foreign body, which is often overlooked for a considerable period of time, as exemplified by the following two cases:

CASE 1

M.M., aged 6. Admitted for bronchoscopy on October 24, 1939. He had been in another hospital for about one month with a history of recurrent attacks of pneumonia. These were apparently of short duration, occurring on either side. There was a history that child had choked while eating peanuts but this was apparently missed for some time.

Two days after admission to our hospital, bronchoscopy was performed and a foreign body (half a peanut) was removed. Patient was given nembutal but no local or general anæsthetic and the foreign body was removed with some difficulty. It was loose in the tracheobronchial tree and each time the patient coughed it came out into the trachea and was then aspirated into one or the other main bronchus. This was presumably what was happening prior to admission and would explain the recurrent pneumonia.

CASE 2

Mrs. S.R., aged 82. About September 15, 1949, while eating soup, she felt a sudden pain in her throat and thought she had swallowed a bone. Following this, there was a persistent feeling of discomfort at the level of the sternal notch. She was admitted and œsophagoscopy was performed. No foreign body was found. X-ray of chest was negative. About one week after discharge from hospital she developed cough and a wheezing which was worse at night. She was seen in medical clinic from time to time and chest x-rays, repeated on two occasions, were negative. She was not acutely ill at any time but there was some weight loss and an obvious wheeze. She was readmitted in December. Chest x-rays taken following admission showed evidence of obstructive emphysema of the right lung.

Bronchoscopy was performed on December 31. The right main bronchus was partially occluded by granulation tissue. On removing some of this, a foreign body was found. It was firmly embedded and only a part of it was removed. Due to patient's age, examination was of necessity rather short. Following this procedure, she developed atelectasis of right upper lobe. Bronchoscopic aspiration on January 2, 1950, helped but did not entirely relieve this. Bronchoscopy was again performed on January 5, and the foreign body successfully removed. It was a large piece of beef bone, 2½ x 1½ cm. Her recovery was uneventful. This patient did not admit to choking when she originally swallowed the foreign body. Persistent questioning revealed that she did choke when she put her finger into her throat in an attempt to dislodge it.

These cases illustrate not only the importance of a careful history but also the necessity of bronchoscopic investigation of obscure chest signs and symptoms.

Benign and malignant tumours.—Adenoma is frequently stated to be the most common benign tumour of the bronchi. It is much more common in women and although there is some difference of opinion regarding its histopathology, it is considered by Jackson[1] to be benign and amenable to bronchoscopic treatment in the majority of cases. He believes that lobectomy or pneumonectomy is indicated only when bronchoscopic cure of the bronchial lesion seems impossible, or when prolonged bronchial obstruction has resulted in serious permanent damage to the distal portion of the lung.

Bronchogenic carcinoma is much more frequent in men and its incidence is apparently rising rapidly. Ewart Martin[5] in a series of 540 bronchoscopies in a two year period found carcinoma in 64 cases. That this disease is rapidly fatal is well shown by Kulvin.[6] In a series of 266 cases of bronchogenic carcinoma only 13 were still alive twelve months after diagnosis was made.

The general concept among practitioners regarding symptomatology are those findings which are usually found in advanced cases, namely, cough, hæmoptysis, loss of weight and pain. These more severe symptoms, however, are usually preceded by a period of varying length in which cough, vague breathlessness and fatigue are present.

The use of bronchoscopy with biopsy of suspected tissue, tumour cell search of bronchoscopically aspirated secretion, as well as tumour cell search of sputum are probably the greatest aids in arriving at an early diagnosis. We have found that tumour cell search of sputum will give positive results in many cases. It can be repeated frequently without discomfort to the patient but with very few exceptions a positive results should be confirmed by bronchoscopy.

X-ray examination of the chest is very important and will sometimes reveal a suggestive lesion in a previously unsuspected case. In Ewart Martin's[5] series, 10% were discovered on routine roentgen examination. He, however, states: "I am of the opinion that when a shadow appears on a roentgenogram the lesion is inoperable".

Based on data from hundreds of cases, Clerf[3] states "Bronchoscopic biopsy yields a positive diagnosis in 60 to 80% of the cases and bronchoscopic anatomicopathologic findings warrants a diagnosis in an additional 10 to 15% of cases". It is apparent, however, from the results of surgical treatment in our own and other centres, that when the diagnosis can be made bronchoscopically, it is frequently too late to effect a cure. It is important, therefore, to make a diagnosis before large bronchi become involved.

This necessitates cytological studies on the patient's sputum and on bronchial secretions which can be obtained bronchoscopically from the suspected area. Clerf[3] in the article previously cited states "It has been conclusively demonstrated in at least an additional 20 to 25% of cases that carcinoma can be diagnosed positively in those cases whose lesions are beyond bronchoscopic vision".

I have presented the above data in an attempt to demonstrate the importance of early diagnosis. If the outcome of this disease is to be successfully altered it is essential that the diagnosis be made while the disease is in its earliest stages, *i.e.*, when the signs, symptoms, and clinical findings are minimal.

Asthma.—Bronchoscopy in cases of asthma is of value (1) to confirm the diagnosis, since certain asthmatic symptoms such as wheezing, etc., are frequently symptoms of other conditions; and (2) to give symptomatic relief when obstructing secretions cause aggravation of symptoms.

Cicatricial stenosis.—This may follow tuberculosis, impacted foreign bodies, etc. The safest and most satisfactory treatment is progressive dilatation with bronchial dilators.

PULMONARY SUPPURATION

Chronic bronchitis.—This implies a diffuse mucosal inflammation without the dilatation of bronchiectasis or other pathologic processes. The chief characteristic is chronic, productive cough. It is a term which is frequently loosely applied to numerous undiagnosed lung conditions, many of which would be accurately diagnosed if bronchoscopy were performed. Jackson[1] in referring to chronic bronchitis found that of 92 consecutive cases referred with a diagnosis of this condition, only 20 had nothing more than an objective diffuse mucosal bronchitis. Bronchoscopic aspiration is of assistance in the treatment of these cases, for if aerosol penicillin or other local treatment is to be used, removal of secretions from the terminal bronchi is of prime importance.

Bronchiectasis.—In the diagnosis of bronchiectasis, bronchoscopy is of value (1) to better localize the involved lobe or segment of a lobe, (2) to remove secretions before doing a bronchogram, and (3) to aspirate secretions for culture. Both Holinger[4] and Jackson[1] stress the importance of bronchoscopy in the prevention of bronchiectasis by early recognition and removal of foreign bodies, dilatation of bronchial stenosis and bronchoscopic aspiration of areas of pulmonary suppuration and suppurative bronchitis. These conditions, if not treated, are definite etiological factors in bronchiectasis.

Surgical removal of the involved lung tissue is now a recognized form of treatment for bronchiectasis and bronchoscopy is a very necessary adjunct to it. It is employed preoperatively to remove infected secretions, not only from the involved area, but also over-flow secretions from the healthy lung. Postoperative bronchoscopic aspiration is also an important factor in preventing pulmonary complications.

There still remain many cases of bronchiectasis which cannot be treated surgically because of general physical condition, extent of the disease, or the degree of functional impairment as indicated by bronchospirometry. In these cases bronchoscopic aspiration is a valuable adjunct to postural drainage and is an important part of the palliative treatment. We have one patient who has attended our endoscopic clinic for 20 to 30 years. She has extensive bilateral bronchiectasis and comes for bronchoscopic aspiration simply for the relief it affords her. During this time, however, she has had very few acute pulmonary infections and it is quite possible that the repeated aspirations have been a factor in preventing these. This patient has also been of invaluable assistance in the training of our staff in the technique of bronchoscopy.

Lung abscess.—In this condition the use of chemotherapy, especially aerosol penicillin in combination with other methods of administration, has been of definite value. Bronchoscopy, however, should always be done to rule out etiological factors such as foreign body or bronchial stenosis. Aspiration of secretions and removal of obstructing granulation tissue are still important factors in effecting a cure.

Postoperative pulmonary atelectasis.—This is probably primarily an obstructive rather than a suppurative lesion. It is supposedly due to obstruction of one of the main bronchi by a mucous plug. By the time most of these patients are examined bronchoscopically, however, the appearance is that of an extensive purulent bronchitis. The mucosa of the tracheobronchial tree is fiery red and the secretion very thick and purulent. To quote Holinger:[4]

> "The bronchial mucosa is little changed in the early stages of this condition and there are relatively few bacteria in the secretion. Later the secretion becomes

purulent and foul-smelling because it has been an excellent culture medium for organisms. A purulent bronchitis develops which may progress to lung abscess or bronchiectasis, or to a fatal termination, as the patient drowns in his own secretions.''

Postoperative aspiration of secretion from the tracheobronchial tree, before patient's return to the ward, is a useful prophylactic measure following long surgical procedures. Simple procedures such as encouraging patient to change position, and to cough, and inhalation of carbon-dioxide to speed up respirations, will relieve many cases of postoperative atelectasis. If the patient, however, does not show definite improvement following the above measures, bronchoscopy is indicated. The larynx should be anæsthetized but it is wise to use little or no anæsthetic in the trachea. The procedure can be quickly and effectively done without moving the patient from his bed. It is simply necessary to have him lie diagonally so that his head will project over the edge. If bronchoscopy in these cases is not delayed too long, the relief obtained is quite dramatic. In occasional cases it is necessary to repeat the procedure.

TUBERCULOUS TRACHEOBRONCHITIS

According to Clerf:[3]

''Statistical reports indicate that routine diagnostic bronchoscopic examination of all tuberculous patients admitted for treatment will show an incidence of demonstrable tuberculous tracheobronchitis of about 10%. In tuberculous patients suspected of having tracheobronchial lesions the incidence varies from 25 to 30%.''

As this is a relatively new field for bronchoscopic examination and treatment, the indications and contraindications are not as yet clearly defined. Most of us remember when pulmonary tuberculosis was a definite contraindication to bronchoscopy. It gradually became apparent, however, that not infrequently cases subjected to diagnostic bronchoscopy were subsequently found to have tuberculosis. The diagnosis in some of them was, in fact, made by this method of examination. The fact that no untoward result followed these examinations indicated that this disease was no longer a contraindication. The advances made in thoracic surgery as applied to the treatment of tuberculosis have made bronchoscopy a necessary procedure. According to Myerson[2] bronchoscopy is requested by clinicians to ascertain the presence of tuberculosis of the bronchial tree for the following reasons:

(1) As a routine procedure before thoracic surgery. (2) Atelectasis. (3) The persistence of tubercle bacilli in the sputum despite apparently successful pneumothorax or thoracoplasty. (4) A wheezing, coarse, noisy type of breathing. (5) The presence of tubercle bacilli in the sputum despite apparently negative x-ray findings. (6) An unexpected spread of the disease to previously uninvolved lung. (7) To ascertain the part of the lung from which bacillus-laden sputum is coming. (8) To ascertain the cause of a shift of the mediastinal content to either side as seen during fluoroscopy.

Myerson also mentions the following as definite contraindications to bronchoscopy in pulmonary tuberculosis:

(1) Active tuberculosis of the larynx. (2) A healed stenosed larynx. (3) Recent hæmoptysis. (4) Marked debility. (5) Acutely active pulmonary disease. (6) Severe systemic infections and metabolic disturbances.

He warns that cases must be carefully selected, otherwise the procedure may cause a spread of the disease. Preferably it should be done on relatively inactive cases and the bronchoscope should be handled with great care. It should not be forced through a trachea or bronchus which is narrowed by the disease.

Although bronchoscopy as a diagnostic aid is now a recognized procedure in pulmonary tuberculosis, the value of endobronchial treatment in this disease is still, however, not definitely established. Cauterization of ulcerations would appear to hasten healing provided the above contraindications to bronchoscopy in this disease are kept in mind. There is still a difference of opinion regarding the advisability of treating tuberculoma of the bronchi either by cautery or bronchoscopic removal.

OBSCURE PULMONARY LESIONS

A persistent cough of unknown etiology, regardless of negative x-ray findings, is an indication for bronchoscopy. As mentioned before, it is usually the first symptom of bronchial carcinoma. Secretions aspirated may reveal tumour cells, yeast organisms or a fungus. A wheeze is an indication of bronchial obstruction and unless the cause is definitely established, the trachea and bronchi should be further investigated by direct examination. Hæmoptysis usually is a contraindication to immediate bronchoscopy but it should be done at a later date. Frequently no cause is found but examination may lead to a diagnosis of bronchiectasis, adenoma, foreign body or even early carcinoma.

BRONCHOSPIROMETRY

With the advance of thoracic surgery, bronchospirometry has become a very important

procedure. By means of it valuable information regarding functional capacity of each lung may be obtained. It has, however, created another indication for bronchoscopy as it is very important to rule out any ulceration, obstruction, or other lesions of the trachea or bronchi before attempting this form of respiratory investigation.

VISUAL AND MECHANICAL AIDS TO BRONCHOSCOPY

The increasing importance of bronchoscopic diagnosis has necessitated certain new visual and mechanical aids. Until recent years lesions in upper lobe bronchi could only be visualized if they were very close to or involved the main bronchus. As the upper lobe bronchi lead to almost half of the total pulmonary field this was a definite limitation. The development of bronchoscopic telescopes has now made it possible to see "around the corner" and visualize lesions in this area. These telescopes are made in different sizes and also in different types for right angle, retrograde or forward view. As an important addition to our armamentarium Holinger and Johnston[7] have devised a bronchoscope with telescopically guided forceps for upper lobe biopsy. The forceps is of the coil spring type and can be guided into the upper lobe by an ingenious but simple device on the telescope. Cup or cutting type of biopsy forceps, or forward grasping forceps can be used. These new developments are valuable aids in the diagnosis of carcinoma and other lung disease.

SUMMARY

1. Contraindications to bronchoscopy are very few.

2. Patients showing obscure pulmonary signs and symptoms should have the benefit of direct visualization of the tracheobronchial tree.

3. The prognosis in cases of carcinoma of the lung can be improved only if diagnosis is made early.

4. Bronchoscopy is now a necessary procedure in many cases of pulmonary tuberculosis.

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TRENDS IN MODERN PSYCHIATRY*

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ONE may discuss trends in two ways. By observation one may report activities going on at various places which in themselves show a trend, and one may present several major trends in which psychiatry is moving and give evidence to support the points. I would like to do both, briefly.

The State of Wisconsin has recently co-ordinated its mental hygiene services. It has secured a full-time, highly paid commissioner and brought under his legislation the work of state hospitals, mental hygiene work, and program of the mental health authority, the various institutions for the mentally deficient, the county homes, the court cases of criminality and juvenile delinquency, the program in psychiatry and neurology of the medical school, out-patient clinics of the hospitals, training schools for boys and girls, and the prison system. This is matched by the action of the special commission in New York State, which after reviewing prison cases involving mental conditions and noting the universality of mental conditions, recommended the placing of them in the hands of the Commissioner of Mental Hygiene, rather than in the Department of Correction. This again is matched by the program of the State of N.S.W., Australia, which is attempting to find a Professor of Psychiatry on a full-time basis, build for him a neuro-psychiatric institution, place under his charge the teaching of the medical school, the care of mental patients in hospitals, research work as sponsored by the State, child guidance clinics as we know them, and advice to the courts. These indicate a tendency to co-ordination of effort.

The authorities of Parker Pen Co. of Wisconsin are asking the A.P.A. to sponsor an Institute for the purpose of studying basic needs in industrial medicine in the psychological area, in other words industrial psychiatry, and will bring in as a nucleus the heads of several dozen small industries such as abound in that highly industrial state: the sponsorship of the State Medical School will be sought.

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Psychiatric education will receive a clarifying forward impetus when a big company of 75 to 100 leaders in medical schools representing the deans and departments of psychiatry will meet probably in June, 1951, for ten days, after a year's preparatory period, to consider all types of psychiatric teaching for doctors and future doctors, under a grant just received by the American Psychiatric Association.

Publication of two books, one on "Conditioned-Reflex Therapy" by a clinical psychologist so-called, and on "Dyanetics" by another psychologist, challenge the theory of the neurosis as related to the school of dynamic psychiatry. Either the basic concepts of analytical psychology are extremely wrong, or the proponents of these beliefs which include a large percentage of psychiatrists today have failed in educating the public to the degree that it welcomes a view apparently contrary to popular belief and scientific evidence. Dianetics is a new form of therapy and treatment whereby the most serious of mental diseases can be cured in a few hours merely by getting the patient to substitute direct thinking by logic for confused thinking dominated by feelings.

The custom of the section on Psychiatry and Neurology of the Medical Congress of Australia to hold all its meetings with one or another section representing other specialties, indicates a trend to bring the sections into paths of common thinking. This is further pronounced by the stated purpose of the Congress which is to present material generally designed for the benefit of the general practitioner rather than for the specialists, who it is said have their own meetings from time to time.

Changes in physical concepts are shown in the new buildings designed for older people, in one-storey rambling or cottage type structures which keep patients near the ground and allow them to move about with fewer psychiatric aids and other personnel to escort them. Eating arrangements in smaller units, accessible to patients who can come by themselves, work in the same direction. Relatively cheap construction, below $2,500 a bed, has been produced in Nashville, Tenn., Cleveland, Ohio, St. Peters, Minn. Low one and two storey buildings are the rule of the day in almost all new construction.

The stress on early intensive treatment is evident in the magnificent new Crease Clinic of Psychological Medicine for treatment, teaching, and research, part of the big provincial hospital at Essondale, B.C. This is also evidenced by the new one-storey treatment building just dedicated at the Territorial Hospital of Hawaii. Intensive treatment in that hospital has already lowered the number of beds occupied and may allow discontinuation of some buildings in the near future. Policy for open wards now has resulted in 700 out of 1,100 being free of all locks and keys in that hospital.

The policy of admitting all psychiatric patients to the neuro-psychiatric unit of a big general hospital, only giving intensive treatment, before admission to big state hospitals seems like a possible explanation for the low rate of mental disease as evidenced by hospitalized patients in the Repatriation Commission hospitals of Australia. With a veteran's coverage law quite similar to that of the U.S.—differing from that of Canada—the number of mental patients is 50 to 60% of that in the U.S.

Evidence that size alone is a powerful factor in the handling of a problem in human relations is indicated by the relative increase in personal attention available to the patients in Nevada State Hospital, as far as I know the smallest in any State or Province. Here there are one doctor and one nurse, assisted by essentially untrained people. Yet that doctor and nurse know personally every detail about every patient. He handles the interview treatment for new patients, relatively few in number. She takes care of activities and handles problems arising on the wards. The ratio of one doctor to 361 patients is bad, but is much better than two doctors to 700, or three to 1,000, or 40 to 13,500 as occurs in Pilgrim State Hospital, New York. This small hospital illustrates the effort being made to limit size of hospitals and keep patients in smaller units.

Such illustrations hint at various trends of the day. I would like to use the remaining time at my disposal to name trends that I believe are worthy of attention and are selected out of the total subject of psychiatry as a whole.

PSYCHIATRY A BASIC SCIENCE

There is less emphasis on psychiatry as a specialty and more on it as a basic science common to all medical problems. This is shown by the recognition that it is the profession as a

whole which must take care of the majority of psychological ills; that prevention will be done more by non-medical people who will use principles worked out by specialists for their use; and the general idea that the building of mental health into people in their development is a problem for execution by the public at large in furnishing the proper ingredients for healthy development, and for training in the use of inherited constitutional assets. These indicate that specialists will play a rôle of greater importance in research and teaching and intensive therapy, and do it in relatively diminishing numbers leaving for others the execution of programs. It strengthens the necessity for more research, especially basic research for the little understood psychoses, since preventive methods must wait for understanding of etiology, and it underscores the fact that individual therapy cannot keep pace with the need for therapy for increasing numbers of people and hence cannot be done by specialists alone or by specialists working on an individual basis, that is, if we are ever to take care of the entire needs of all people.

Therefore, the rôle of the specially trained psychiatrist must be to spread his skill as far as possible; in delegating to others, under supervision, all that he can; in increasing knowledge through research and in teaching; teaching in medical schools and to physicians in practice looking for aid in handling their patients, and in resident training courses, adding to the number of trained psychiatrists. Teaching in psychiatry is necessary for those becoming nurses, psychologists, social workers, occupational therapists, recreational and vocational leaders and others. Much can be accomplished by helping to train volunteers who can, under supervision, do much of our hospital and community work. Another important area of teaching and spreading an appreciation of psychiatry as basic to all medicine is in working with all other specialists in their residency training programs and as they seek consultation on the wards and in their practice. Obviously no psychiatrist can be useful to other physicians unless he is well rounded and possesses talents they not only want to use but which they understand.

I suggest that any psychiatrist who has received special training should share that training and accept responsibility for the psychological needs of all patients. He could do that by accepting the formula 50% of time to private patients, 25% for research and teaching combined, and 25% for public service. For those in salaried positions this may well allow more time for teaching, research, and public service.

Psychiatry will always remain a clinical specialty, but its basic science aspects should assume much more importance and merit greater and greater attention from those who are in fact well trained and have something to give.

TREND TOWARD OBJECTIVITY

Traditionally, psychiatry has been more of an art than a science. It has been related to persuasion, suggestion, to emotional support. It has been impossible to measure either in its doses or its results. Its methods have been empirical—even its greatest physical and mechanical and chemical treatment methods, discovered by accident—achieving its results in ways not understood and proclaiming results that cannot be proved even though they appear genuinely helpful.

Criticism that psychological theories have not been amenable to logical analysis or logical testing are common and sometimes justified. Certainly the evidence that has been offered in terms of controlled experiments, statistical studies, and quantitative reports has been far from satisfactory.

There is demand today that we get our house in order and present our material in logical fashion. Delay in achieving an objective science has, I believe, been caused by a necessary period of experimentation, of individual case study in psychopathology; by difficulty of refining our tools for measurement of abstract ideas and in clarifying our concepts so that we can reach general agreement as to nomenclature and description of our major concepts. Clarification is coming about slowly. Revision of standard nomenclature is gaining a further step forward in the new nomenclature now being appraised, that sent out by the A.P.A. Committee on Nomenclature and Statistics.

We are also waiting for tools for measurement of clinical results, of emotional states, of changes in perception, ideation, the uses of mechanisms of defence. A Round Table at the last A.P.A. meeting on "Methods of Evaluation of Results of Treatment" accentuated the great

need for evaluation from the standpoint of choice of therapy, use of personnel, prognosis, planning of treatment programs, research, and for such mundane reasons as proper justification of budget requests for personnel and training programs. Shortage of personnel makes it imperative that the most efficient use of skill and experience be made available to every patient.

This need to evaluate different methods of therapy, to give the patient the most for time, energy and money is felt by all categories of doctors. It exists in all specialties but the nature of psychiatric problems makes it most difficult in our specialty.

Not only do we need to agree on description, naming and quantitative and qualitative degrees concerning our patients' illness, but we need a method of recording these indices and numbers—records that can be compared with each other by other people, that do not take too much time and that can be used statistically. It is a horrible thought that most of our statistics of the past are of little value for they give false information based on uncertain meanings of words.

Winslow's remark that "statistics are often an attempt to use precise terms and methods concerning things of which we know little" warns us to beware of conclusions unscientifically derived and to put every effort into achieving data that can be properly statistically studied and used.

A further evidence that we need more objectivity in the presenting of our ideas is shown by the failure of psychiatrists and others in the field of mental health to get strong backing either from the profession as a whole or from appropriating bodies. We fail where proponents for cancer, heart disease, and other drives are outstandingly successful.

Straws in the wind are indicative that we are working to remedy this defect. The effort to agree on nomenclature and concepts is before you now. Psychologists are making progress in improved testing and other devices. Psychiatric clinicians, such as Malamud are presenting rating scales. The Mental Hospital Service will make a drive at the next Mental Hospital Institute to obtain common language and items of agreement in material and form in all annual reports.

Backed by the A.P.A. Committee on Nomenclature and Statistics, an effort will start at the October meeting to get every state and province to adopt a punch card system of recording data on every patient in state and provincial hospitals. Out of these is the I.B.M. Hallerith card system. We hope in three biennial legislative sessions, or six years, to get this adopted. In the meantime we must come to an agreement on what data to put on the cards and I believe we can do that in six years also. It is hoped that all hospitals and clinics and private practitioners will in time have this common method at their disposal. Then we can study our cases, analyze our results and concentrate on any small or large subject we like.

A paper was presented at a V.A. hospital seminar recently on the topic, "Administration in Every Day Psychiatry," advocating the admission of a little of the new science of administration into our medical practice as well as the operating of our organizations and institutions. These principles are so simple that they can be repeated here. Briefly all organization big and small and also individual affairs can be operated on three principles. Our business colleagues, says L. Urwick of London in his little book "Essentials of Administration", use: (1) Principles of Research, or getting the facts (diagnosis). (2) Principle of Forecast or projecting or prognosing the future by these facts (prognosis). (3) Principle of Planning (prescription). All in the framework of a clearly defined objective.

We need to get facts, see where they lead and make a plan, and we must have our objective clearly in mind. I see psychiatry going in the direction of clarity, precision, and objectivity, and I urge every co-operative effort to further this trend toward objectivity.

I would like to discuss a third big trend, that of the greater use of social forces, but that will wait for another occasion. It is indicated however by group methods, total push, use of auxiliary personnel, and the greater interest we are now taking in environmental influences and changes in the environment. It is shown in the movement together of psychiatry and the social sciences.

DISCUSSION

Dr. Stokes.—We can attack some of our problems from various levels, perhaps starting at the community one. We must remember that an illness is an illness in living. We must not get confused at the objectivity

which can be obtained at various levels, which may lead to tensions in discussions dealing with research on problems that confront us. We must place stress on research in action and we often find ourselves in a dilemma when dealing with administrative problems. It has been a great pleasure listening to Dr. Blain.

Dr. Jones.—I should like to add my thanks to Dr. Blain for coming here. I would like to ask one question; namely, why do we not have more psychiatry in administrative systems such as found in schools of nursing. There is a tremendous need for the introduction of the principles of human behaviour into various institutions such as medical schools and so on. I would also like to ask about the pension schemes in Australia. In the U.S. they give pension for the neuroses; in Canada we do not. How does the question of finances enter into the situation in Australia?

Dr. Blain.—It is essentially the same as in the United States, but I am not sure of the amounts involved. There is, however, strong public pressure to raise pensions, to the extent that it is quite a bad situation. There is also a state co-ordination of various offices that appears rather burdensome. It is interesting to note that five of twenty-two on the King's Honor List in Australia were doctors; one in the State Hospital system.

THE H-ION CONCENTRATION OF NORMAL AND DISEASED SKIN*

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THE object of this paper is to review some of the recent literature on the *in situ* H-ion concentration of the normal and diseased skin and to speculate as to the importance of attempting to regulate the pH both for therapeutic and prophylactic purposes.

The normal skin has a pH from 4 to 6.0, depending on many factors including the site and the time after washing. Regions where apocrine glands predominate have a higher pH since the apocrine secretion is only weakly acid; eccrine secretion however is more acid (pH 3.8-5.6) and thus in eccrinous regions the pH is lower. In hot weather or when the eccrine glands are actively secreting the skin pH is perceptibly decreased. This normally acid condition of the skin has been referred to as the "acid mantle". Alteration of this acid mantle is the initial process in contact dermatitis. Maintaining a constantly low skin pH may prevent the development of contact dermatitis since the skin is more susceptible to primarily irritating substances or allergenic substances when its pH is high and therefore a dermatitis will occur more readily.

Bernstein has shown that 1 minute after washing a skin area with soap the pH was 7.0 and that it was 70 minutes before this area returned to its prewashed pH of 4.0. In a similar series, Hermann and Bernstein showed that this increased pH may be evident for as long as 3½ hours after washing with some soaps. When there are skin abnormalities with a change in H-ion concentration towards alkalinity this action is more prolonged both in the diseased area and in the surrounding skin. These findings are supported by Guild and others.

The return to normal pH depends upon how completely the skin is defatted and how rapidly the sebaceous secretions can be liberated. Skin acidity is increased in hot weather so that it takes less time in the summer for the skin to return to its normal pH, than in the winter. (This may be the reason for the so-called eczema hæmalis and probably explains why more hand eczemas are seen in the colder months.)

When the skin is exposed to alkaline substances the colloids of the keratin layer are coagulated; this reduces their stability and thus decreases their resistance to infection. Alkali is always set free in a soap-water mixture by hydrolysis with a resulting pH of from 10 to 11. This is true of all soaps, even those which are neutral or superfatted.

Thus the frequent use of soap, due to its alkalinity and fatty acid content interferes with the normal acid mantle and is a predisposing cause in the development of a sensitivity dermatitis. (This may be the reason for the prolongation of therapy in "athlete's foot", especially when in addition to washing the feet frequently, saturated fatty acid compounds are applied several times daily.) The acid pH of the skin, according to Goodman, is the resulting acid concentration following the evaporation of eccrine gland secretion. Variations in the pH depend upon: (1) the character and quantity of eccrine sweat; (2) the character and quantity of insensible watery perspiration; (3) the prevention of evaporation of eccrine sweat with resulting alkaline ammoniacal disintegration; and (4) the character and amount of oil gland secretion, which is only weakly acid and undergoes alkaline decomposition with evaporation. Thus the pH of skin is determined by the composition of the particular sweat and its residue. It is noted that a rise of pH occurs: (1) after washing with soap; (2) from

* Read before the Canadian Dermatological Society, Quebec City, June, 1950.

TABLE I.
pH OF NORMAL AND DISEASED SKIN

Disease	pH of affected site	pH of normal areas (average)			Type of skin
		Hand and dorsum	Palms	Forearm	
Contact dermatitis	6–6.5	6.0	5.5	6.5	Dry
	6.0	6.0	5.5	5.0	Dry
	6.5	6.0	6.0	6.5	Dry
	6.5	6.0	5.0	4.0	Normal
	6.0	6.0	5.5	4.5	Dry
	6.5	5.5	5.0	5.5	Oily
	6.5	5.5	5.0	6.0	Dry
Seborrhœic dermatitis	6.5	6.5	6.0	5.5	Normal
	7.5	6.5	6.5	6.0	Dry
	6.5	5.5	5.0	5.0	Moist
	6.5	5.0	5.0	5.5	Moist
	6–6.5	5.5	6.0	5.5	Moist
Neurodermatitis (circumscribed)	6.5	5.0	5.0	5.5	Moist
	5.0	5.0	4.0	6.0	Dry
	6.5	5.5	5.0	5.5	Dry
	5.0	5.5	4.0	5.5	Moist
Hyperidrosis (hands and feet)	7.5	5.5	5.0	5.5	Moist
	7.5	5.0	5.0	5.0	Moist
	7.5	5.5	4.0	5.0	Moist
Dermatomycosis	7.0	5.5	5.0	6.0	Dry
	6.5	5.5	4.0	6.0	Dry
Indolent ulcers (8 cases)	8–9.5	5.5	5.0	6.0	Dry
Skin surrounding lesion	4–5.5				

Cases selected as representative of the disease from large group tested.

decomposition of the superficial horny layers; (3) in the presence of dust; (4) as a functional deficiency of the epidermal appendages (disintegrated sweat glands); and (5) as a result of inflammatory alterations. Seborrhœic dermatitis, psoriasis, tuberculosis, tertiary luetic lesions, and indolent ulcers, all have a pH which is 7 or higher while acute inflammations with pus formations, lupus erythematosus (discoid), acrodermatitis atrophicans, lupus vulgaris, and healthy granulation tissue have a pH below that of normal skin. Table I shows the pH values in normal and diseased areas in several common diseases.

This consists of several groups averaged under their respective headings. The pH was estimated by dropping and agitating for a few seconds, two drops of the indicator solution on the area being tested. The resulting colour was compared with a colour chart. This chart has colours for the pH range from 4 to 11.5. (The indicator solution used was British Drug House's long range indicator.) As can be noted from these results there is often very little alteration of the pH, but it is important to realize that this minimal pH change occurs.

It seems reasonable to assume that for the most effective results in topical therapy the medications should have a pH as close as possible to that of the skin when normal, *i.e.*, pH 4.5 to 6.5. With this in mind the pH of a variety of commonly used medications was tested along with some soaps chosen at random from the many that confront the shopper in drug stores and groceterias. Table II shows these results. It is noted that the medications which commonly give the most symptomatic relief and therefore are most beneficial to the patient namely the solutions, Lassar's paste and boric acid ointment, have an H-ion concentration which is compatible with that of normal skin; this probably explains why these substances are so readily tolerated. A new base (neutrabase) has a pH of 7, thus living up to its trade name. These preparations were all tested as they came from the druggist for use by the patient.

Alteration of the pH may be of more particular value in the treatment of fungus and bacterial infection. Leise and James found that by adjusting the pH of Sabouraud's dextrose or maltose agar to 10.5, the growth of saprophytic fungi was inhibited while patho-

TABLE II.
pH OF COMMONLY USED MEDICATIONS AND SOME SOAPS

Medication	*pH*
Preparations tested	
Vaseline	4.0
Eucerin	6.0
Unibase (P.D.)	6.5
Neutrabase (Shuttleworth)	7.0
Cetylaur (D.V.A.)	6.0
Cold creams (several brands)	7–8.5
1% Ung. acid boric	5.0
5% Ung. acid boric	5.5
Ung. calaminæ	6.0
Ung. zinc oxide	7.0
3% Vioform in 1% Ung. acid boric	5.0
18% sod. bicarb. in cetylaur (antihydrotic, deodorant)	9.0
Penicillin Ung. (D.V.A.)	6.5
Nivea cream	5.5–6
3% Vioform in nivea	6.0
Ung. quinolor	4.0
Paste Ihle (special formula)	4.5
Lassar's paste	5.5
Lotio alba (D.V.A.)	6.5
Lotio nacconal (intraderm sulphur solution)	7.5
Lotio calaminæ	10–11.0
Lotio calaminæ with ½% phenol	10.0
Liniment calaminæ	7.0
Liniment calaminæ with 2% vioform	7.0
Liniment calaminæ with 3% solution of coal tar	5.0
D.V.A. scalp lotion (alcoholic)	5.0
Burows solution 1/20	5.0
Alibour water 1/20	5.5
1/10000 aqueous solution of mercuric bichloride	4.0
Toronto tap water	7.5
Boracic solution 1/20	6.0
Normal saline	7.5–8
Sodium bicarbonate 1/20 solution	9.5
Surfocaine (Lilly)	4.0 or less
Derm. cream (Ingram & Bell)	8.5
Ungt. caligesic (Sharp & Dohme)	9–9.5
Calmitol Ungt.	5.5–6
Soaps and shampoos	
Phisoderm (oily)	4.0
Bromley	9.5
Ivory	7.5
Cowboy soap	7.5
French castile	6.0
Wrisley castile	7.5
Tide	9.5
Chat	11.0
Orvus (P. & G.)	4.5
Allenbury's shampoo	6.0
Convoy shampoo	6.0
Halo	4.0
Drene	6.5

genic fungi flourished. It was their opinion that this relationship was due to a trypsin-like enzyme elaborated by the growing fungus to enhance its growth. These workers found comparable results with some bacteria.

It is noted in Table I that for dermatomycosis a rise of pH was found. Thus on the skin as well as in the laboratory the fungus is growing in a medium which is more alkaline or rather less acid than normal. In hyperidrosis of the feet with interdigital maceration the pH is 7 or higher, a state which is ideal for the invasion of either fungus or bacteria.

Foley, Hermann and Lee in 1947 were able to show that fatty acids were more potently antifungal at pH 5, than at higher pH levels. In 1948 Foley and Lee repeated their investigations and supported these findings.

The conclusions from these facts, therapeutically, would be, (1) that to prevent growth of pathogenic fungi the diseased site should be made acid and probably best adjusted to a pH of 4.5 or 5, and (2) that application of fatty acids to fungus-infected skin is best made when the diseased area has a pH of 5 or lower. (Practical support for these views was noted by Bernstein and Hermann who used an acid shampoo in treating and preventing ring worm of the scalp; their results were encouraging.)

Pathogenic monilia albicans was cultured by Karnaky on Sabouraud's medium at any pH and was found flourishing on the vaginal mucosa at any pH. However monilia infection of the vagina responded to treatment with acid douches and Karnaky believed that monilia and other abnormal vaginal organisms were destroyed indirectly when the acid douche created a more normal environment. Thus enabling the vaginal mucosa to return to its normal state.

There is thus evidence to support the contention that adjustment of skin is a useful therapeutic process. Baths taken once or twice daily in water which has been acidified with aluminium acetate are soothing and healing but lead to irritation from their drying effect. Attempts to lower the skin pH by artificially stimulating the sweating apparatus are only fairly successful, *i.e.,* fever produced either by the fever cabinet or by the injection of T.A.B. vaccine or some other foreign protein. These methods would be more successful if they were continuous rather than intermittent forms of therapy. Possibly the repeated applications of a highly acid water soluble cream would keep the pH low enough over a sufficient period so that that skin could return to normal.

SUMMARY

The surface pH of the skin then is the result of (and probably a measure of) the physiological functions of the skin, and is changed by certain environmental conditions and/or agents

and by disease. Soaps increase the pH for relatively long periods and thus may initiate reactions to industrial irritants or to allergenic materials, and soaps definitely prolong or aggravate dermatitis of an irritant or allergic etiology. Pathogenic fungi and bacterial thrive on alkaline media and skin infected by these organisms gives high pH readings and it is suggested that these organisms can be removed by simply controlling the pH long enough for the skin to return to normal.

There appears to be no diagnostic value to pH determinations except that with disease the pH is altered to some extent; however the realization that there is minimal pH change is important from the standpoint of therapy.

Knowing the pH of many of the commonly used medications and detergents should be useful in attempting to adjust the skin pH to its normal value.

CONCLUSIONS

More investigation will be required into the values of pH adjustment or of the maintenance of a satisfactory acid skin mantle. It seems reasonable to conclude however that for dermatitis due to fungi, bacteria, external irritants and allergenic substances, treatment with preparations buffered to a pH of 4.5 to 6 is most desirable and that the use of soap or alkaline detergent is contraindicated for most successful therapy. Similarly in the prevention of this group of diseases, acid detergents or acid baths before and after the use of alkaline detergents should be advised and since it is the hands and arms that are most frequently affected possibly an acid hand cream should be used frequently, especially in the cooler months.

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RÉSUMÉ

Il existe normalement un revêtement acide de la peau qui, lorsqu'il est altéré, forme le premier stage de la dermatite dite de contact. Le pH de la surface cutanée varie habituellement de 4 à 6.0 et est influencé par les conditions du milieu, les agents physiques ou la maladie. C'est ainsi que dans un mélange d'eau et de savon les alcalins sont libérés par hydrolyse avec une hausse du pH de 10 à 11. Les corps gras du savon ont aussi pour inconvénient de détruire le revêtement acide de la peau, prédisposant ainsi aux dermatites de contact. On note une hausse du pH dans certaines circonstances, à savoir: (1) après lavages répétés au savon; (2) par décomposition des couches cornées superficielles; (3) au contact des poussières; (4) dans le cas de transpirations profuses; (5) comme résultat d'altérations inflammatoires.

Champignons et bactéries se multiplient en milieu alcalin et haussent d'autant le pH, aussi est-il important d'en effectuer thérapeutiquement l'extermination, et ce faisant de baisser le pH de façon a permettre à la peau de recouvrer sa couche acide protectrice, en prescrivant par exemple des applications répétées d'une crème soluble dans l'eau et à teneur acide élevée.

L'auteur est d'avis que pour les dermatites causées par des mycoses, bactéries, pommades irritantes et substances allergènes, on devrait se servir de préparations titrées à un pH de 4.5 à 6 et d'éviter en même temps l'emploi de savon ou de détergent alcalin. Une crème acide appliquée fréquemment sur les mains et les bras surtout, et par les temps froids notamment, constitue le meilleur préventif.

ANÆSTHESIA FOR TONSILLECTOMY AND ADENOIDECTOMY*

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WITHIN the last fifteen years the operative technique for tonsillectomy and adenoidectomy has undergone a gradual but well-defined evolution. Otolaryngologists have become more meticulous and thorough in their efforts to remove completely the tonsil and adenoid tissues. More care is taken to ensure that all bleeding points are under control before the patient leaves the operating room. To the anæsthetist this signifies primarily that longer periods of narcosis are necessary for each patient. No longer does it suffice to saturate a patient's blood stream and nervous system with ether, and then allow the surgeon five minutes in which to operate. The anæsthetist must be prepared today to maintain an even, adequate plane of narcosis for from thirty minutes to more than an hour. It is not surprising that new techniques of anæsthesia have developed hand in hand with the changes in operative management.

Anæsthesia for tonsillectomy and adenoidectomy should not be considered a minor event. The responsibilities of the anæsthetist perhaps are greater than with many other surgical pro-

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cedures. Usually the operation is elective, performed on an active healthy child. There is little excuse for anything going wrong. Often it is the child's first visit to hospital, and it falls to the anæsthetist to avoid the creation of psychological barriers which may adversely influence his life in the future.[1] The nature of the operation itself provides the challenge of maintaining a free and unobstructed airway, while at the same time preventing aspiration of blood and infected tissue into the tracheobronchial tree.

Regardless of the locality in which he may be practising, there are certain ideal conditions and circumstances for which the anæsthetist must strive in order to achieve the best for his patients. These factors, which will be described, are aimed at decreasing the morbidity and mortality which is associated still with tonsillectomy and adenoidectomy.

Enough has been said already to realize that this is a procedure requiring hospitalization. But education is still needed to convince parents and some members of the medical profession that unnecessary risks are being assumed when this operation is done in an office or the home. It is best to bring the child into hospital the afternoon before surgery. This allows him time to become adapted to his surroundings and to realize that this new place is not to be feared. In a way it may be considered as part of his premedication. From the surgical viewpoint, it is preferable for patients to be watched closely by the nursing and resident staff for 24 hours after operation. Thus the child spends two nights in hospital.

PREMEDICATION

One of the commonest complications seen in children during the weeks following tonsillectomy are night terrors and nightmares. No exact explanation has been given for these, but they are less frequent when adequate premedication has been given. As intimated above, premedication is not only the administration of drugs before operation. It also includes the kindly approach to the child and the avoidance of too many strange and unusual experiences all at one time. Hence the advisability of admission to hospital the day before operation. At the Children's Memorial Hospital it is the custom to give these children nembutal, morphine and scopolamine one hour before going to the operating room. The dosage of these drugs is seen in Table I. With this combination patients are quiet and asleep when seen by the anæsthetist, and yet they will open their eyes and respond to questions. They are co-operative, they have no fear, and they are not worried by the new environment of the operating room. It is felt that the nembutal[2] plays a definite rôle in the production of this somnolent state, as patients receiving only morphine and scopolamine are often apprehensive and querulous when they arrive in the theatre. The dosage of each drug is small enough so that their combination does not produce any depression of the respiratory centre.

TABLE I.
PREMEDICATION

Age	*Weight*	*Morphine*	*with*	*Scopolamine*
Up to 2 mos.	7 - 10 lbs.	gr.		gr. 1/600
2 - 3 mos.	10 - 12 lbs.			1/600
3 - 4 mos.	12 - 14 lbs.			1/600
4 - 7 mos.	14 - 16 lbs.	1/144		1/600
7 - 11 mos.	16 - 19 lbs.	1/120		1/600
11 - 18 mos.	19 - 24 lbs.	1/108		1/600
18 mos. - 2 yrs.	24 - 27 lbs.	1/72		1/450
2 - 3 yrs.	27 - 30 lbs.	1/60		1/450
3 - 5 yrs.	30 - 40 lbs.	1/48		1/450
5 - 8 yrs.	40 - 55 lbs.	1/36		1/300
8 - 10 yrs.	55 - 65 lbs.	1/24		1/300
10 - 12 yrs.	65 - 80 lbs.	1/18		1/200
12 - 14 yrs.	80 - 90 lbs.	1/12		1/150
Adult	90 lbs. and up.	1/8 - 1/4		1/150 - 1/100

NEMBUTAL DOSAGE

1 - 3 yrs.	0
3 - 5 yrs.	gr. 1/4
5 - 7 yrs.	gr. 1/2
7 - 10 yrs.	gr. 3/4
10 - 14 yrs.	gr. 1

Other methods of premedication have been utilized for tonsillectomy. Basal anæsthesia, employing paraldehyde,[3] avertin,[4] or pentothatl,[5] has been successful in obliterating the sensorium and abolishing the fear of coming to the operating theatre. However, a patient receiving these drugs requires careful watching before operation to ensure that his airway does not become obstructed. After operation the effect of the agent may persist for several hours and delay return of the active reflexes which aid so much in promoting a smooth convalescence. In considering premedicant drugs, their influence on the postoperative course must not be neglected.

INDUCTION

With a co-operative, adequately premedicated child in the theatre, the task of the anæsthetist in providing a smooth induction is lightened. Blowing nitrous oxide over the face and gradually lowering the mask on to the face

is a pleasant method of induction. Once the mask is completely on the face, oxygen must be supplied to avoid the development of hypoxia. Alternatively, many patients will go to sleep quietly if one drops vinethene on an ether mask and gradually lowers it on to the face. Once the patient is completely asleep, anæsthesia may be deepened with drop ether. After a nitrous oxide-oxygen induction, the ether mask may be substituted for the face-mask, and the anæsthesia continued with vinethene followed by ether. On the other hand a pentothal-curare solution may be given intravenously to provide further anæsthesia, or cyclopropane may be added to the gaseous mixture.

The personality of the anæsthetist plays a big rôle in producing a smooth induction. It is better for him to remove his mask during this period as the child may be alarmed at seeing a face three-quarters covered. If the patient is inclined to talk, question him about his school, his tricycle, his brothers and sisters, subjects which make up his daily routine. Avoid sudden movements, stroke his head gently, and use a reassuring tone of voice. Repetition of words is helpful as the patient is dozing off. It is such details that are conducive to a pleasant induction devoid of alarm and apprehension.

MAINTENANCE

The technique employed during maintenance of anæsthesia is more important than the agents used. Safe anæsthesia can be provided only if an endotracheal tube is utilized. Safe anæsthesia means the ability to maintain adequate oxygenation at all times. It means the provision of moderate, even, planes of anæsthesia. It implies that blood and detritus will not be aspirated into the tracheobronchial tree. It implies the ability to provide instantaneous efficient artificial respiration if required. These conditions can be met if the anæsthetist is assured of a completely patent airway throughout the operation. In tonsillectomy and adenoidectomy such assurance is present only if an endotracheal tube is in place.

Mention should be made here of the objections which the otolaryngologists may make about the endotracheal tube occupying valuable space in the oropharynx. They become adapted to the tube very quickly and do not find it interfering with their work. Each of the three specialists who operate at the Children's Memorial Hospital state that now they would not do a tonsillectomy unless endotracheal anæsthesia were employed. The orotracheal route is preferred so as not to complicate the adenoidectomy. The tube is shifted from one side of the mouth to the other to suit the needs of the surgeon.

Orotracheal intubation is carried out most easily in the third plane of the third stage of anæsthesia, when the laryngeal and pharyngeal reflexes are obtunded completely. After intubation, the patient may be lightened and carried satisfactorily in the first or second plane of the third stage. For maintenance it has been found that a combination of agents probably disturbs the metabolism of the patient less than when

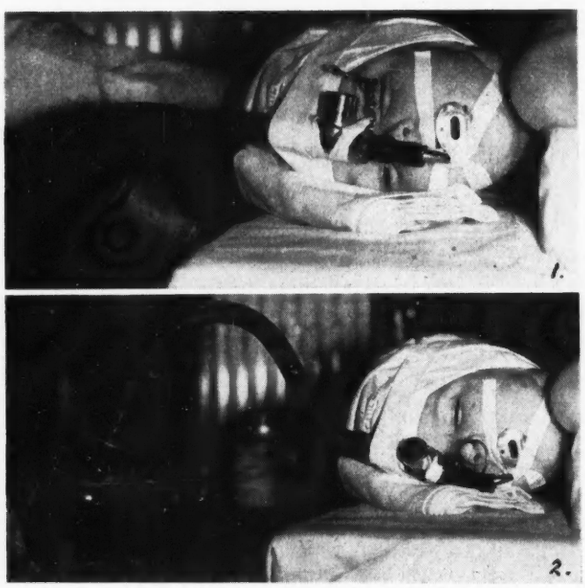

Fig. 1.—Orotracheal, non-rebreathing technique employing nitrous oxide, oxygen and ether.

Fig. 2.—Orotracheal, non-rebreathing technique employing the Flagg bottle with ether.

one agent is used alone.[6] Moreover, it is thought that the protective reflexes return earlier in such cases postoperatively.

In the last three years at the Children's Memorial Hospital, 2,190 tonsillectomies and adenoidectomies have been done, employing the non-rebreathing technique[7] and an endotracheal tube (Fig. 1). The agents used were nitrous oxide and oxygen in a 75: 25 ratio, with ether added in sufficient quantities to produce an adequate plane of anæsthesia. If a gas machine is not readily available, anæsthesia may be maintained with ether alone using a Flagg bottle (Fig. 2). In a group of these cases pentothal-curare combinations were used for intubation, and during maintenance nitrous oxide and oxygen were

added in a 75: 25 ratio. In most of these latter patients it was necessary to assist the respirations because of the depressant effects of pentothal and curare. If anæsthesia became light during the operation, instead of giving more pentothal or curare, and thus prolonging the postoperative recovery period, small amounts of ether or trichlorethylene were added to the gaseous mixture. Griffith, of Montreal, employs endotracheal cyclopropane and oxygen for tonsillectomies and finds this agent quite satisfactory. Of these several combinations mentioned, it is probable that nitrous oxide, oxygen and ether provides the safest anæsthesia, because in the planes required for operation these agents produce the least depression of respiration.

At the conclusion of operation the patient is turned on his side and the table placed in slight Trendelenburg position. The endotracheal tube is removed rapidly during the expiratory phase of respiration in order to reduce the possibility of laryngospasm. The plane of anæsthesia is light, and if ether has been employed the patient usually vomits before leaving the operating room. If there is any associated reflex laryngospasm, this may be treated on the spot with suction and oxygen inhalations. Patients who receive pentothal-curare-nitrous oxide anæsthesia vomit less than those who have ether. Regardless of what agents are used, the presence of the endotracheal tube allows the anæsthetist to carry the patients in sufficiently light planes of anæsthesia that active reflexes appear rapidly after operation and the danger of postoperative aspiration is minimal.

On return to the ward the children are placed on their side in the semi-prone position and the foot of the bed is raised up well. A suction machine is immediately available.

COMPLICATIONS

In considering the complications of anæsthesia, it is useful to remember that "If you know the trouble you might get into, and are prepared to get out of it, then usually you don't get into it".[8] Probably the most important complication with which the anæsthetist must contend is the development of anoxia. This may occur at any time during anæsthesia, especially if the operation is being done without an endotracheal tube. In discussing a case of decerebrate rigidity occurring after tonsillectomy,[9] it was noted that "suboxygenation over a period of time set the mechanism in motion so stealthily" that permanent damage had been done before the condition was recognized. The presence of a mechanically patent airway will do much to avoid the possibility of such disasters.

During induction hypoxia may occur as a result of breath-holding. This produces marked anoxæmia if allowed to persist for longer than thirty seconds. It is usually a reflex response to the presence of too high a concentration of an irritant vapour, and may be terminated by lifting the mask off the face so that a breath of air may be taken. Partial upper respiratory obstruction is often accompanied by stertor, the low-pitched sound caused by the tongue falling back into the pharynx; or by stridor, which is the result of air passing rapidly through a narrow aperture between the vocal cords. Complete obstruction is accompanied by heaving movements of the abdomen and gross indrawing of the chest. Any of these conditions are serious and should be corrected early if permanent harm is to be avoided.

At the end of the operation a reflex laryngospasm may occur following extubation, or may be associated with retching and vomiting. If these do not receive attention, permanent changes may develop in the child's nervous system.

Anoxæmia is a troublesome problem because cyanosis, which is its first clinical sign, does not become manifest to the average observer until the arterial oxygen saturation has fallen about 30% below normal.[10] Thus when cyanosis does appear the condition is sufficiently advanced to demand immediate treatment. Therapy should be directed towards relieving the precipitating cause, usually upper respiratory obstruction, concomitant with administration of oxygen to correct the anoxæmia. Whenever an anæsthetic is being given, means should be at hand of administering oxygen under positive pressure. If a gas machine is not available, an oxygen tank with a face-mask and rebreathing bag is quite sufficient for the purpose. Without oxygen, hypoxia may persist so long that permanent cortical damage may result.

As indicated previously several combinations of agents may be employed to produce satisfactory anæsthesia for tonsillectomy and adenoidectomy. One agent not mentioned was ethyl chloride. This drug possesses many of the pharmacological properties of chloroform,

and has no place as a routine agent in modern anæsthesia. Respiratory arrest and cardiac arrest may occur almost simultaneously with this agent, with disastrous results.[11] There is no excuse for using this drug when vinyl ether, an equally potent agent, is available. Vinethene has a wide margin of safety between respiratory and cardiac arrest. Occasionally it produces convulsive movements in the patient, but these are invariably arrested quickly if the mask is removed and oxygen given under slight positive pressure.

When pentothal-curare mixtures are given for induction and intubation, it is wise to assist the respirations with oxygen-rich mixtures for two minutes until the curare has had sufficient time to act. If left alone, the patient's respirations become ineffectual, and anoxæmia develops rapidly.

In the age group between four and eight years careful examination must be made for any loose teeth. If any are found, and they are very loose, it is better to extract them before attempting intubation. When any are missing after the laryngoscope has been used, careful search must be made until they are discovered. In one case at the Children's Hospital, two teeth were knocked out during intubation, but only one could be found. After tonsillectomy had been completed, a bronchoscopic examination was done, and the missing tooth removed from the left main bronchus. This pointed out clearly the necessity of treating any loose teeth with respect.

Postoperative pulmonary complications are extremely rare when endotracheal anæsthesia is employed. During the last four years at the Children's Memorial Hospital, in which more than 3,000 tonsillectomies and adenoidectomies were done, there were no pulmonary abscesses reported and only one patient who developed bronchopneumonia. This responded rapidly to chemotherapy. When endotracheal tubes were not used, the reported incidence of lung complications was higher.[11, 12] In 1930 Chevalier Jackson reported[13] 224 cases of pulmonary abscess following tonsillectomy and adenoidectomy. Eight of these cases terminated fatally. It is probable that improved techniques both in surgery and anæsthesia have played a part in reducing the incidence of pulmonary complications.

SUMMARY

1. An outline is presented of ideal anæsthesia for tonsillectomy and adenoidectomy.

2. The importance of endotracheal intubation is stressed.

3. Anæsthetic complications during and after operation are discussed.

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RÉSUMÉ

Pour l'anesthésiste de nos jours la technique opératoire pour l'ablation des amygdales et des adénoïdes comporte de plus longues périodes de narcose. Dans ces cas l'anesthésie est devenu un évènement important, et cependant il offre peu d'excuses pour les fausses manœuvres. Pour offrir un minimum de risques, l'opération doit se pratiquer à l'hôpital, ainsi l'enfant s'adapte à son nouveau milieu et il est plus facile de lui administrer la prémédication qui s'impose. Dans leur hôpital, le Children's Memorial, les auteurs donnent d'habitude à leurs patients, aux doses indiquées à la Table I, les médicaments suivants: morphine avec scopolamine et nembutal.

Quel que soit l'anesthésique employé, la personnalité de l'anesthésique joue un grand rôle, c'est à lui avant tout qu'il revient de rassurer et de calmer l'enfant.

Seul l'emploi d'un tube endotrachéal rend l'anesthésie exempte de danger; elle maintient en tout temps une bonne oxigénation des tissus, empêche la chute de sang et de débris dans les bronches et partant les complications pulmonaires post-opératoires, enfin assure un passage aérien complètement ouvert pendant toute l'opération. Avec de la pratique l'opérateur s'habitue au tube rapidement et finit par ne plus le trouver embarassant.

De toutes les complications intéressant l'anesthésiste, l'anoxie est le plus grave, surtout lorsque l'on ne se sert pas du tube endotrachéal; à éviter aussi est l'hypoxie qui apparaît lorsque le patient retient sa respiration. L'anoxémie cause aussi des ennuis parce que la cyanose ne vient à se manifester que lorsque la saturation artérielle d'oxygène est rendue au-dessous de 30% de la normale. Aussi, importe-t-il d'avoir à sa portée un ballon d'oxygène.

Congenital Meckel's diverticulum is subject to various complications, such as ulceration and hæmorrhage, inflammation, obstruction, intussusception, foreign bodies and incarceration in hernias. It should, therefore, be re-emphasized that in all celiotomies a search should be made for this anomaly, and particularly should the search be made when the pathologic changes found in the appendix are not sufficient to account for the subjective and objective findings.—L. L. Haynes and P. D. Cronemiller, *U.S. Armed Forces Med. J.*, **1**: 1329, 1950.

TREATMENT OF IRON DEFICIENCY ANÆMIA WITH SACCHARATED IRON OXIDE GIVEN BY THE INTRAVENOUS ROUTE*

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PATIENTS with iron deficiency anæmia, refractory to or unable to tolerate iron by mouth, present a difficult therapeutic problem. The search for a safe and effective iron preparation for parenteral use covers many years.[1] Small doses of iron have been given in this way on many occasions. Intramuscular injections were excessively painful and intravenous doses much in excess of 10 mgm. produced severe toxic reactions. Dramatic hæmatologic responses in patients with iron deficiency anæmia have been observed after intravenous infusions of large doses of colloidal iron hydroxide, but severe reactions occurred in every case.[2] Nissim[3] reported the successful treatment of iron deficiency anæmia with large intravenous doses of saccharated iron oxide. His preparation was a variable product but toxic reactions were less severe than those encountered by earlier workers. Slack and Wilkinson[4] developed a stable preparation of saccharated iron oxide for intravenous use and recorded the successful treatment of 60 cases of iron deficiency anæmia. No severe toxic reaction occurred although large doses of this material were used.

We are presenting the responses of six patients with iron deficiency anæmia to intravenous injections of saccharated iron oxide. Five were refractory to iron by mouth and one could not tolerate this therapy.

Clinical material.—The salient features of the six patients are shown in Tables I and II. Clinical and hæmatologic studies indicated iron deficiency in each case. In no case did iron deficiency seem to be due to blood loss. Two of the three women were past the menopause and the third had normal menses. Four of the six patients had undergone partial gastrectomy for peptic ulcer; one had cirrhosis of the liver; and one, a chronic alcoholic, had received antabuse for twelve months.

Saccharated iron oxide.—We used three preparations, each of which contained 2% iron. Two, "feojectin" and "ferrivenin", were proprietary products.* The third was prepared by Mr. F. Zahalan, chief pharmacist of the Hospital, according to the method of Slack and

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* Supplies of "Feojectin" were donated for this study by Smith, Kline and French Laboratories. "Ferrivenin" is manufactured by Messrs. Benger's Limited.

TABLE I.

CLINICAL FEATURES

Case number	Age	Sex	Duration (years)	Causative factors	Symptoms						Signs				
					Tiredness	Dyspnœa	Palpitation	Anorexia	Dyspepsia	Dysphagia	Pallor	Glossitis	Angular stomatitis	Koilonychia	Achlorhydria
1	61	F.	20	Partial gastrectomy	+	+	+	+	+	0	+	+	0	+	0
2	42	F.	2	Partial gastrectomy	+	+	+	0	+	0	+	0	+	+	+
3	66	M.	6	Partial gastrectomy	+	+	+	+	+	0	+	+	+	0	+
4	38	M.	½	Antabuse (?)	+	+	0	+	0	0	+	0	0	+	0
5	65	M.	2	Cirrhosis of liver (?)	+	+	+	0	0	+	+	+	+	0	+
6	55	F.	5	Partial gastrectomy	+	+	+	+	+	0	+	+	0	+	

TABLE II.

RESPONSE OF 6 CASES TO SACCHARATED IRON OXIDE BY THE INTRAVENOUS ROUTE

Case number	*Before treatment*														*After treatment (no Oral Iron given)*													
	Days before 1st treatment	*R.B.C. (millions per c.mm.)*	*Hgb. (grams %)*	*Days before 1st treatment*	*R.B.C. (millions per c.mm.)*	*Hgb. (grams %)*	*Days before 1st treatment*	*R.B.C. (millions per c.mm.)*	*Hgb. (grams %)*	*Hæmatocrit (%)*	*Red cell diameter (microns)*	*Serum iron (gamma %)**	*U.I.B.C. (gamma %)†*	*Estimated iron deficit (grams)*	*Total dose of iron (grams)*	*Days after 1st treatment*	*R.B.C. (millions per c.mm.)*	*Hgb. (grams %)*	*Hæmatocrit (%)*	*Red cell diameter (microns)*	*Serum iron (gamma %)*	*U.I.B.C. (gamma %)*	*Days after 1st treatment*	*R.B.C. (millions per c.mm.)*	*Hgb. (grams %)*	*Hæmatocrit (%)*	*Red cell diameter (microns)*	*Serum iron (gamma %)*	*U.I.B.C. (gamma %)*
1	2920	3.5	8.4	13	3.6	8.4	1	3.3	8.7	34	7.3	10	480	1.5	1.5	24	4.0	12.4		7.6	114	250	270	4.4	12.4	43	7.6	41	315
2	12	3.8	8.6	4	3.6	8.7	1	3.9	8.7	33	7.2			1.25	1.25	95	4.8	14.0	48	7.7			213	4.0	12.2	40	7.7	88	200
3	1161	3.9	9.3	11	3.5	7.8	1	3.3	7.8	28	7.2	10	575	2.5	2.5	23	4.9	13.7		7.7	129	275	174	4.8	14.0	46	7.5	80	370
4				8	4.3	8.1	1	4.2	7.8	30	7.1	8	475	1.8	1.75	49	5.0	14.0	50	7.6									
5	18	3.8	7.8	16	3.7	7.1	1	3.6	7.5	30	7.3	13		2.1	2.1	32	4.7	12.4	47	7.7	125		138	4.3	12.8	43	7.5	121	
6	1286		11.6	8	4.1	11.2	1	3.9	11.0	37	7.2	90	150	1.1	1.1	73	4.3	12.4	40	7.5			102	4.1	12.2	40	7.6	118	115

*Determined by the method of Barkan and Walker (5).

†U.I.B.C.—Unsaturated iron binding capacity of serum estimated by the method of Cartwright and Wintrobe.[8]

Wilkinson.[4] There was no difference in tolerance or response to the three preparations.

The total dose was calculated on the basis of 37 mgm. of iron for each 1% deficit of hæmoglobin (Haldane). It has been estimated that about two-thirds of this amount is used for synthesis of hæmoglobin and one-third to replenish stores of iron.[4] A 50 mgm. dose of iron was given on the first day, 100 mgm. on the second and 200 mgm. on the third and subsequent days. Injections were given from an all-glass syringe into an antecubital vein at a rate not exceeding 5 c.c. per minute. These solutions are strongly alkaline and may cause sloughing when injected into the tissues outside a vein. Care was taken to avoid this.

Toxic reactions.—Reactions to the intravenous administration of many iron compounds are alarming. Irritation of the gastro-intestinal tract may give rise to nausea, vomiting and diarrhœa. Depression of the central nervous system may cause coma. Precipitation of iron particles in the blood may lead to multiple pulmonary and systemic emboli with symptoms like those of fat embolism. These reactions may be fatal. The minimum lethal dose for man is not known but single injections of more than 10 to 20 mgm. have usually produced severe reactions.

It is noteworthy that no toxic reactions were encountered following the 52 intravenous injections of 50 to 200 mgm. of iron as saccharated iron oxide given to the six cases described here. On two occasions patients noticed a sense of warmth in the arm during an injection. No local venous thromboses resulted.

Response to treatment.—Response to treatment was good in every case. Symptoms such as tiredness, dyspnœa, palpitation, loss of appetite and dyspepsia were relieved rapidly. Koilonychia was gradually replaced by normal nail formation. Glossitis and angular stomatitis subsided and the one patient with Plummer-Vinson syndrome was completely relieved of dysphagia. Clinical improvement was apparent as soon as 48 hours after starting treatment. Red blood cell counts and hæmoglobin levels rose quickly and have been well maintained for as long as nine months (Table II). The hæmatologic response was often dramatic, with a reticulocyte peak of 10 to 23% after 6 to 10 days (Fig. 1).

COMMENT

The responses to intravenous treatment with the three saccharated iron oxide preparations were equally prompt and satisfactory. No toxic reactions were encountered. Great care is necessary in the preparation of the solution described by Slack and Wilkinson.[4] Use of such a preparation for treatment implies a responsibility to first test its toxicity in laboratory animals and ensure that the solution is stable and of correct pH. Feojectin and ferrivenin are more convenient because they have been standardized before release and there is no need for preliminary testing in the hospital laboratories.

It is clear that, in the doses used, these solutions of saccharated iron oxide are safe and effective in the treatment of iron deficiency

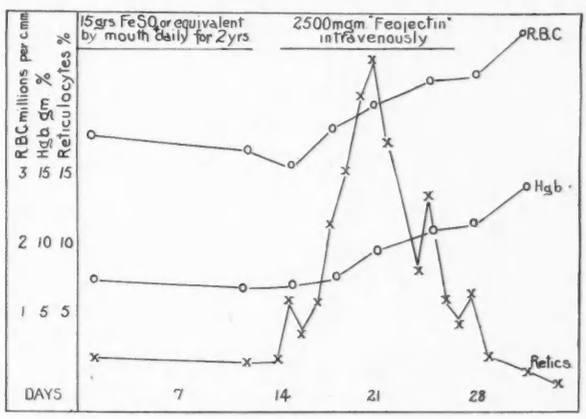

Fig. 1

anæmia. There is no doubt that the development of this agent represents an important advance in therapy. The proper indications for its use cannot be defined at the present time. Most cases of iron deficiency anæmia respond satisfactorily to treatment with iron by mouth and use of the intravenous route is unnecessary. We think that the use of iron by the intravenous route should be restricted to cases of iron deficiency anæmia which cannot be adequately treated with iron by mouth. Saccharated iron oxide is clearly indicated for patients who are refractory to or cannot tolerate iron by mouth, or when replacement of iron is an urgent matter. An example of the last is iron deficiency anæmia late in pregnancy.[7]

The late results of giving large amounts of iron intravenously to patients who have no iron deficit are not known. A condition resembling hæmochromatosis sometimes results from oft repeated blood transfusions. The possibility

that a similar disorder may be produced by the injudicious intravenous use of saccharated iron oxide should be considered.

SUMMARY

1. Six patients with iron deficiency anæmia, refractory to or unable to tolerate iron by mouth, were treated with saccharated iron oxide by the intravenous route.

2. No toxic reactions were encountered although single doses of iron as large as 200 mgm. were used.

3. Response to treatment was good in every case.

4. It is suggested that use of iron by the intravenous route be restricted to cases of iron deficiency which cannot be adequately treated with iron by mouth.

We are grateful to our colleagues of the Departments of Medicine and Surgery of the Montreal General Hospital for their co-operation in the investigation and treatment of these cases.

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SOME EFFECTS OF INTRAVENOUS INJECTIONS OF SACCHARATED IRON OXIDE ON SERUM IRON AND UNSATURATED IRON BINDING CAPACITY*

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TOXIC reactions are seldom encountered when single intravenous doses of iron as large as 200 mgm. daily or twice daily are given as saccharated iron oxide.[1 to 5] In striking contrast, severe reactions may follow the intravenous injection of small doses of many other iron compounds. It seemed interesting to study the effects of intravenous injections of saccharated iron oxide on serum iron and unsaturated iron binding capacity (U.I.B.C.) in the hope that this paradox might be resolved.

Holmberg and Laurell,[6] and Cartwright and Wintrobe[7] gave single intravenous doses of 1 to 25 mgm. of iron in the form of "ascorbic acid reduced ferric chloride", or "iron ascorbate". Toxic reactions occurred only when the capacity of the serum to bind iron was exceeded. Under these circumstances serum iron levels rose to the limits of the total iron binding capacity, the unsaturated iron binding capacity became zero and the surplus unbound iron rapidly left the blood.

SACCHARATED IRON OXIDE

We used three preparations, each of which contained 2% iron. Two, "feojectin" and "ferrivenin", were proprietary products.* The third, "M.G.H. 3", was prepared by Mr. F. Zahalan, chief pharmacist of the Hospital, according to the method of Slack and Wilkinson.[2] There was no difference in tolerance or response to the three preparations.

METHODS

Six patients with iron deficiency anæmia volunteered for these experiments. Single doses of 40 to 200 mgm. of iron as saccharated iron oxide were given from an all-glass syringe into an antecubital vein at a rate not exceeding 100 mgm. per minute. Venous blood was drawn from the opposite arm before the injection, five minutes after the injection, and at various intervals during the subsequent 24 hours. No anticoagulant was used. Serum iron and U.I.B.C. were determined by the methods of Barkan and Walker[8] and Cartwright and Wintrobe[7] respectively.

RESULTS

No toxic reactions were encountered. Serum iron and U.I.B.C. values are shown in Table I. Five minutes after each injection the serum iron rose to a level far above the total iron binding capacity of the serum. The U.I.B.C. was reduced but never approached zero. At the end of 24 hours serum iron levels and U.I.B.C. approximated the initial values.

DISCUSSION

It is clear that saccharated iron oxide differs markedly from other iron compounds with respect to toxicity and effect on serum iron and

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† Senior Medical Research Fellow, National Research Council, Canada.

* Supplies of "Feojectin" were donated for this study by Smith, Kline and French Laboratories. "Ferrivenin" is manufactured by Messrs. Benger's Limited.

TABLE 1.

EFFECTS OF INTRAVENOUS INJECTIONS OF SACCHARATED IRON OXIDE ON SERUM IRON AND IRON BINDING CAPACITY

Case number	*Dose of iron*	*Time of collection of blood*	*Serum iron mg. %*	*U.I.B.C. mg. %*
		0*	50**	400
1	100 mgm. (as "M.G.H. 3")	5 minutes	820	200
		15 minutes	890	200
		30 minutes	940	200
		0	40	310
2	40 mgm. (as "ferrivenin")	5 minutes	500	260
		0	30	310
3	100 mgm. (as "ferrivenin")	5 minutes	1,700	220
		0	70**	150
4	100 mgm. (as "ferrivenin")	5 minutes	1,210	50
		15 minutes	1,080	50
		24 hours	100	150
		0	10	580
5	100 mgm. (as "ferrivenin")	5 minutes	1,350	430
		4 hours	460	330
		8 hours	310	400
		16 hours	70	430
		24 hours	30	530
		0	370**	250
5	200 mgm. (as "feojectin")	5 minutes	2,150	60
		12 hours	410	270
	200 mgm. (as "feojectin")	12 hours and 5 minutes	1,900	100
		24 hours	250	360
		0	170**	240
6	200 mgm. (as "feojectin")	5 minutes	1,820	190
		12 hours	250	350
	200 mgm. (as "feojectin")	12 hours and 5 minutes	1,970	220
		24 hours	230	250

*0—Immediately before injection of iron.
**—Serum iron elevated by injections on previous days.

U.I.B.C. It appears that saccharated iron oxide itself was not toxic in the blood and was quite stable. The decreases in U.I.B.C. suggest that a small fraction of this complex broke down to liberate "free iron" which was immediately bound by the normal mechanism. In the doses used, the amount of iron freed in this way was never sufficient to exceed the total iron binding capacity. Toxic reactions therefore did not occur. With larger doses toxic reactions are to be expected and indeed have been encountered.[2, 4]

SUMMARY

1. Single intravenous doses of 40 to 200 mgm. of iron as saccharated iron oxide were given to six patients with iron deficiency anæmia.

2. No toxic reactions were encountered.

3. Five minutes after each injection the serum iron rose to a level far above the total iron binding capacity of the serum.

4. The U.I.B.C. was reduced but never approached zero.

5. At the end of 24 hours serum iron levels and U.I.B.C. approximated the initial values.

6. An attempt has been made to explain why iron given by the intravenous route as saccharated iron oxide was not toxic in the doses used.

We are grateful to our colleagues of the Departments of Medicine and Surgery of the Montreal General Hospital for their co-operation in this investigation.

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SURITAL SODIUM: CLINICAL IMPRESSIONS OF A NEW THIOBARBITURATE FOR INTRAVENOUS ANÆSTHESIA*

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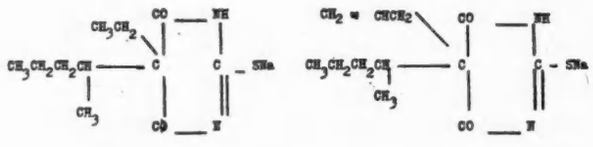
THE search for new anæsthetic agents continues and the latest addition to the large field of intravenous agents is surital sodium.† Most intravenous barbiturates at present available for anæsthesia have the same disadvantages; namely, respiratory and circulatory depression, sensitization of laryngeal reflexes, (or lack of depression of this reflex), poor relaxation and prolonged recovery. Because of these drawbacks any new agent which might eliminate or even diminish some, or all, of these objections deserves investigation.

CHEMISTRY AND PHARMACOLOGY

Surital sodium is the sodium salt of 5 allyl 5 (1 methyl butyl)-2-thiobarbituric acid. It differs from the better known pentothal sodium in the substitution of an allyl group for the ethyl side chain (Fig. 1). It has a molecular weight of 276.33, a 5% solution is clear light yellow in colour, and has a pH of 10.00 to 10.5. Reduction of the pH results in precipitation. It is prepared for use by the addition of neutral distilled water. It was found that the use of normal saline as a solvent resulted in a cloudy solution although normal saline is recommended by Helrich *et al.*[1] Since it was desired to compare this new agent with pentothal, it was prepared in a 5% solution as has been our custom with pentothal.



Sodium pentothal — Sodium surital

Fig. 1

Kelly *et al.*[2] suggested from studies on dogs that surital is more potent and less stable than pentothal. Wyngaarden *et al.*[3] have shown surital to have a potency of 1.5 as compared to 1.0 for pentothal. These workers report a more rapid induction, less excitement and more rapid recovery than with pentothal. There was a lower rate of accumulation of surital as based on duration of anæsthesia, following repeated doses of the drug. They believe that the rate of accumulation is a function of the total dose given and the more potent drugs require smaller doses and hence a shorter time for detoxification.

Woods *et al.*[4] have studied the effects of this agent as compared to others on the heart of dogs. They have demonstrated that in equivalent doses, surital is probably less and definitely not more toxic to the heart than pentothal. They found that respiratory failure is the primary cause of death since most cardiac abnormalities appear to be on the basis of inadequate oxygenation.

Clinical study.—Because of the limited quantity of surital available, all administrations were carried out by experienced anæsthetists. Surital was used in every case in which pentothal would otherwise have been chosen. The intermittent injection technique was the most frequently used method of administration; the continuous intravenous drip of 0.2 or 0.1% solution was occasionally used for hypnosis during regional analgesia.

This series represents 490 anæsthesias in which surital was used, either for induction, induction and intubation, as a hypnotic with regional analgesia, for total anæsthesia supplemented with nitrous oxide and oxygen, and for basal anæsthesia by the rectal route in children. The patients varied in age from 3 weeks to 82 years and included all risks and all types of surgical procedure. All patients received atropine with or without morphine or demerol one hour preoperatively. The duration of anæsthesia varied from 3 minutes to 255 minutes, and the amounts of surital used ranged from 0.13 to 2.5 gm.

For induction of general inhalation anæsthesia.—When used for this purpose usually 3 to 5 c.c. of 5% surital was sufficient to produce a smooth rapid induction, following which anæsthesia could be maintained with ease using gas, ether, cyclopropane or trichlorethylene. The change-over to cyclopropane was most satisfactory as the respiratory depression which is so frequent when pentothal is used for induction, was seldom encountered with surital. Ether of course often required more surital and a more gradual introduction of the agent. Because surital is rapidly destroyed it should be given rapidly when used for this purpose otherwise a large dose will be necessary.

For induction and intubation.—Pentothal syncurine (decamethonium bromide) mixtures are almost routine in this institution for the induction and intubation of good risk patients. For this series we used an average dose of 0.4 gm. surital and 3 mgm. syncurine given rapidly when using this technique. Induction was rapid and relaxation of the jaw and laryngeal structures was satisfactory. Using pentothal we have become accustomed to a rather prolonged period of apnœa after this procedure. With surital and syncurine the apnœa is of much shorter duration and often does not occur. It was noted however that when cyclopropane was to be the maintenance agent

* From the Department of Anæsthesia, University of Alberta Hospital, Edmonton, Alta.

† Surital Sodium used in this study supplied through the courtesy of Messrs. Parke, Davis & Co.

apnœa persisted for some time, or if apnœa was not present after induction and intubation, it often occurred after the cyclopropane was commenced. This has been our experience when pentothal is used in this manner.

Use with nitrous oxide and oxygen.—This supplement was the most frequently used, and is a routine whenever an intravenous barbiturate is the main agent. Use of this supplement provides analgesia and maintains normal blood oxygenation and reduces the amount of the main agent required. No essential differences in technique were noted when using surital instead of pentothal. Early in the series it was found that because of the lack of respiratory depression surital was being administered more frequently than was necessary; this was corrected with experience and it was soon realized that the total dosage used was diminishing with increased experience with this agent.

Use with curarizing agents. — Curarizing agents are used in this institution to provide muscular relaxation only, and consequently are given intermittently and not mixed with pentothal or surital except for intubations. Syncurine was the most frequently used agent in this series, but intocostrin and flaxedil were used in a few cases. No apparent differences were observed when these agents were used with surital instead of pentothal.

For hypnosis during spinal analgesia.—Surital was given as a 0.1 or 0.2% continuous intravenous drip or as intermittent injections of 5% solution to provide hypnosis during procedures under spinal. Induction was smooth but maintenance of a smooth level of hypnosis was difficult with the dilute solutions and with the concentrated intermittent injections it was difficult to avoid placing the patient in surgical anæsthesia. If nitrous oxide and oxygen was given also then a smooth hypnosis could be maintained with ease.

Emergence is smooth and rapid and the patients were usually awake on leaving the operating theatre. We find pentothal 0.2% better suited to this purpose, although Helrich *et al.*[1] prefer surital. They used a 0.3% solution which we have not tried, but this factor could well be the explanation for the difference in our impressions. Surital being more rapidly detoxified than pentothal should require a stronger concentration to maintain the same level of hypnosis.

Use as a basal anæsthetic in children.—In this institution, basal rectal pentothal for children under 75 pounds in weight has been a routine for many years. The dose of pentothal used is 20 mgm. per pound body weight. Because of the reported increased potency of surital it was decided to commence using it for this purpose in a dose of 10 mgm. per pound body weight, and as a 5% rather than a 10% solution as is done with pentothal. The results were not satisfactory with this dosage so it was increased to 15 mgm. per pound body weight and given as a 10% solution. With this dose the results were as satisfactory as with pentothal in a 20 mgm. per pound dose. Our impression was that sleep occurred more rapidly and that recovery was also more rapid and there was less depression; 95 children were given this basal anæsthetic without complication.

We have not had occasion to use this agent in anticonvulsive therapy although Helrich *et al.*[1] report it to be effective as one would expect.

COMPLICATIONS

Extravascular injection.—This technical accident occurred in 3 cases. Procaine was immediately injected into the area in all cases; no harmful sequelæ resulted in any case.

Phlebitis.—No cases of this nature were reported in spite of our use of a 5% solution.

Respiratory depression.—Depression was significant in only 14 cases out of the 321 who received surital supplemented with nitrous oxide and oxygen. Apnœa rarely occurred except when large doses were given rapidly, as for joint manipulations or when surital was combined with syncurine for intubation; then the apnœa was of very short duration. It was felt that a decrease in rate was as prominent a feature as the decrease in volume when respiratory depression did occur.

We were particularly impressed with the lack of respiratory depression in elderly patients undergoing ophthalmological surgery using surital with nitrous oxide and oxygen delivered through a Leech gasway. The frequent respiratory depression and occasional apnœa when using pentothal has made this a hazardous technique. With surital respiratory depression is no longer feared, laryngospasm being the only serious danger remaining for this type of case when anæsthetized without an endotracheal tube in place.

Circulatory depression. — Hypotension is slight; there is some decrease in all pressures but the decrease does not seem to be as marked as with pentothal. The increase in pulse rate is less than one has become accustomed to when using pentothal. A large dose when given rapidly will produce a marked but only transient fall in blood pressure. Surital's minimal circulatory depression was appreciated in the elderly arteriosclerotic hypertensive patient who so often responds with an alarming fall in blood pressure when given pentothal.

Laryngospasm.—This complication is probably the most feared and the most serious of all that may occur during intravenous barbiturate anæsthesia. There were 7 instances in this series, 3 classified as mild, 2 moderate, and 2 severe. The 2 severe cases were intubated, the mild and moderate cases were self-limited and required no active treatment other than removing an offending airway or deepening the anæsthesia. Three of the cases of laryngospasm, one of which was severe, occurred in ophthalmological cases and were probably the result of attempted placement of the Leech gasway in too light a plane of anæsthesia. It was our impression that laryngospasm was less frequent and more benign with surital than with pentothal.

Bronchospasm.—There were two instances of this complication; one was mild and self-limited, the other more severe and required treatment with intravenous aminophylline.

Coughing.—This unexpected event occurred rather frequently and unfortunately accurate recording of this complication was not made. Coughing usually occurred only after a rapid induction such as was used for intubation. It was never prolonged and rarely more than two or three coughs occurred; it was never troublesome to the anæsthetist.

Hiccough.—This complication occurred in 14 of the 490 cases. No case persisted or required changing to another agent. It was usually self-limited or yielded to carbon dioxide inhalation.

Asthma.—This is generally considered to be a contraindication to intravenous barbiturate anæsthesia and rightly so. Surital was given to 2 proved cases of bronchial asthma and the anæsthetic course was uneventful. Helrich *et al.*[1] administered surital to 4 asthmatics; 2 of these 4 cases developed asthmatic attacks. Because of this small experience it would seem advisable to avoid using surital in asthmatic cases.

Emesis.—Only 4 cases of emesis occurred during anæsthesia amongst the 321 cases receiving surital supplemented with nitrous oxide and oxygen. Two of the cases exhibited the silent regurgitant type of emesis which is the usual type seen with intravenous anæsthetics.

Deaths.—There were no deaths which could be directly attributed to the anæsthetic agent.

DISCUSSION

This small series fully supports the results of experience with experimental animals and clinical use in man. This agent is still far from the ideal anæsthetic agent but in many respects appears to be superior to any of the presently available intravenous barbiturates. When compared with pentothal it appears to be more potent; there is more rapid recovery from a comparable plane of anæsthesia, and there is less circulatory and respiratory depression. A very important advantage is the seemingly decreased incidence of laryngospasm and the brief self-limited more benign nature of the laryngospasm when it does occur.

As with all intravenous barbiturates it is primarily a hypnotic and should be supplemented with some analgesic mixture containing a high percentage of oxygen. Most anæsthetists seem to set their own limit for maximum dosage, but we feel that this must be varied with the case. We have given up to 2.5 gm. without ill effects; Helrich *et al.*[1] have administered up to 3.5 gm. without delayed recovery resulting.

Although surital was used without complication in 2 asthmatics in this series, it is recommended that asthma be considered a contraindication to the use of this agent. Other contraindications to the use of pentothal apply to surital. As a basal anæsthetic agent for rectal use in children surital is an excellent agent producing results equal to those obtained with pentothal but requiring a smaller dose and producing less depression and more rapid recovery. The marked decrease in respiratory depression and laryngospasm and the more benign nature of the laryngospasm with surital has made it our choice of agent for elderly ophthalmological cases where an endotracheal tube is not desired by the surgeon.

The results of this series are in agreement with Helrich's[1] series of 1,200 cases and lead to the same conclusion; namely that this new agent

deserves further clinical investigation. As stated in the title, this article merely records our clinical impressions of surital. At present a comparable pentothal series is being conducted and it is hoped at a later date to publish an accurate comparison of these two agents.

SUMMARY

A new thiobarbiturate for intravenous anæsthesia has been discussed. Its use in 490 cases involving a wide variety of techniques has been described.

Decreased respiratory depression, laryngospasm and circulatory depression, increased potency and more rapid recovery, are its apparent advantages over intravenous barbiturates in current use.

Complications and contra-indications are the same as for pentothal.

The advantages displayed by this agent entitle it to further clinical trial.

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MEDICAL PROBLEMS IN CHEMICAL WARFARE*

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IN 1943 I predicted[1] that the task of delivering a successful chemical attack against the American people was so great that our enemies would not consider it worth trying. With the possible exception of the nerve gases, it seems equally unlikely today that chemical agents offer our potential enemies effective weapons for long range attack. The problems of civil defense against chemical attack, therefore, can be reduced to consideration of a single group of chemical agents, the nerve gases, until such time as an enemy may be able to establish a base at or within our borders.

The nerve gases were first developed by the Germans[2] but are now well known to both our allies and our potential enemies. They are a family of chemicals having the common property of irreversibly inhibiting the enzyme cholinesterase. They are nearly colourless, essentially odourless liquids, which yield toxic vapours on evaporation. More toxic than formerly known chemical warfare agents, they may gain entrance to the body by inhalation of the vapour or by absorption of the liquid agent through the skin, the eyes or the gastro-intestinal tract.[3]

The symptoms induced are due largely or entirely to the inactivation of cholinesterase. This leads to the accumulation of acetylcholine in both the central and the peripheral nervous system and to acetylcholine poisoning. Most of the classic symptoms of both muscarine and nicotine poisoning develop. In severe cases the excessive accumulation of acetylcholine at the myoneural junctions causes a curare-like flaccid paralysis.[4]

Man and experimental animals exhibit a rapid progression of essentially identical symptoms.[5a] Exposure to traces of the vapour causes pinpoint constriction of the pupils in a few minutes, usually accompanied with mild paroxysmal bronchoconstriction and a watery nasal discharge. A slightly greater exposure induces ciliary spasm, pain on focusing the eyes and a drawing sensation or pain in or back of the globes, radiating frontally or to the occiput, and is often accompanied with moderate photophobia.

At these low doses the paroxysmal bronchospasm does not produce anoxia, lasts only a few days and is readily relieved by small doses of atropine sulphate. The miosis, ciliary spasm and headache are more persistent and do not yield to the usual parenteral doses of atropine. The ophthalmic administration of homatropine hydrobromide is required for relief of mild cases, or repeated instillations of atropine, for the severer cases, until good mydriasis is obtained. The headache and eye pain are usually relieved promptly with the induction of mydriasis. The ophthalmic instillations may have to be repeated several times, as miosis and ciliary spasm frequently recur.[5]

The inhalation of larger doses of vapour, or the absorption of liquid nerve gas by other routes, causes a rapid and severe bronchospasm, which obstructs both inhalation and exhalation. The subject becomes confused and cyanotic, may

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† Chief of the Medical Division, U. S. Army Chemical Centre, Maryland.

have nausea and vomiting and soon falls unconscious.[5a] Meanwhile, his blood pressure falls to shock level; severe bradycardia develops, and cardiac arrest may occur as a temporary or terminal event (Fig. 1).[6]

If the subject can be given medical assistance before the anoxia is too profound and prolonged, large intravenous or intramuscular doses of atropine may completely reverse the cardiorespiratory condition. The bronchial tree relaxes; ventilation of the lungs becomes normal; anoxæmia is rapidly overcome; the slowed heart regains its rhythm and normal rate, and the blood pressure rises above normal and quickly drops again to normal level (Fig. 1).[6]

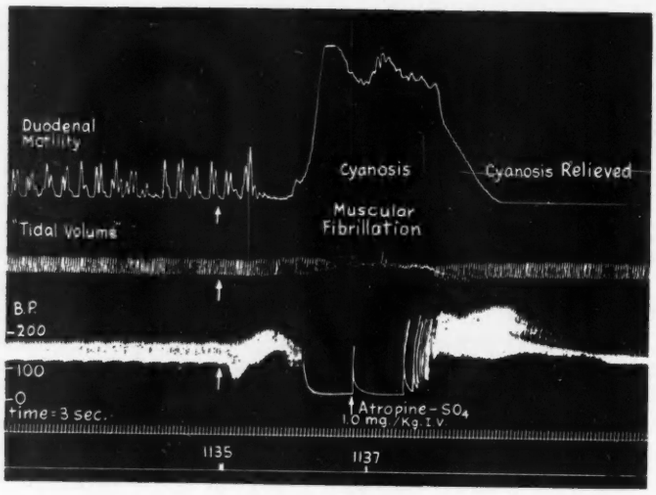

Fig. 1.—The effects of nerve gas and atropine on a dog. Nerve gas was injected intravenously into dog at first marker (arrow) and atropine sulphate at second marker. Upper, the effects on intestine (duodenum); middle, the effects on tidal air (under artificial respiration), and lower, the effects on blood pressure and heart rate.

Relatively large doses of atropine are required for the severe cases, and the principal danger lies in undertreatment. It is essential that the atropine be given by a route by which it reaches the circulation rapidly. Intravenous administration is preferable, from the standpoint both of rapidity of action and of ease of control of dosage. The intramuscular route may be used if the patient is not cold or in shock. Absorption from the subcutaneous and oral routes is too slow for the initial treatment.

Doses of 2 mgm. (1/30 grain) of atropine sulphate should be repeated every few minutes until the cardiorespiratory symptoms are relieved and some dryness of the mouth appears. The amount of atropine some patients can take without the development of atropinization is amazing. Thereafter, smaller oral or parenteral doses of atropine must be administered every few hours for at least several days, since the poisoning is far more persistent than the duration of atropine effects.[7]

Some of these patients will show nicotinic and central nervous system effects, which persist or appear after the muscarinic effects have been controlled with atropine. These effects range from muscular fasciculations and spasmodic twitchings possibly to grand mal seizures of clonic and tonic convulsions. The convulsions may be controlled, to the point that they do not threaten life, with thiopental sodium, trimethadione (tridione) or ether anæsthesia (Fig. 2). Overdosage of thiopental (or any barbiturate) must be avoided, as it acts synergistically with the nerve gases in depressing respiration. A 20% solution of trimethadione, given intravenously in 1 gm. doses every 15 minutes, with a maximum dose of 5 gm., has the advantage of depressing cortical activity effectively without depressing respiration.[8]

If the severely affected patient cannot be treated promptly, profuse salivation, intestinal hypermotility and spasm and incontinence of urine and fæces will develop. The profound anoxia and increasing accumulation of acetylcholine in the nervous system lead to intermittent then almost continuous grand mal convulsions, until flaccid paralysis supervenes.[5a]

The use of atropine is dangerous in severe cases with profound and prolonged anoxia. In experimental animals the sudden release of the heart from vagal control, with the attendant increase in work by the cardiac muscle, in the presence of severe anoxia, leads immediately to ventricular fibrillation and death in a high percentage of the animals.[9] The administration of atropine in these cases should be delayed until the lungs have been ventilated and the heart has made some recovery from anoxia. The convulsive seizures can be controlled, or largely prevented from reappearing, by intravenously administered trimethadione or thiopental sodium, but the urgent problem in these cases is the paralysis of respiration.

At this late stage a very considerable relaxation of the bronchial tree occurs spontaneously, but respiratory paralysis prevents effective respiration. The paralysis is both central, due

to anoxia, and peripheral, due to muscle fatigue and the curare-like blocking of the myoneural junctions of the diaphragm and accessory muscles of respiration by excessive amounts of acetylcholine. The chest is flaccid and collapsed. The usual methods of artificial respiration, such as the Schaefer prone pressure method or the Eve tilt table method are ineffective or impractical.[5b] A new method suggested by Emerson[10] may be worth a trial in emergency, but there has not yet been sufficient work to assess its effectiveness properly. This method consists in

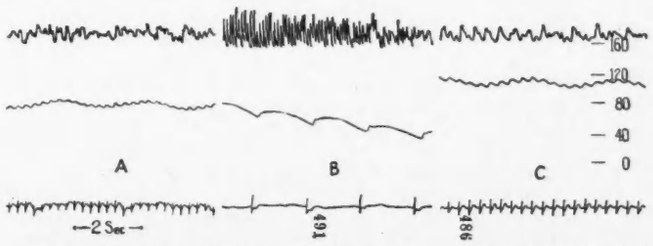

Fig. 2.—The effects of nerve gas and trasentine(R) methiodide on brain waves of a rabbit. Upper, electroencephalogram (motor cortex); middle, blood pressure, and lower, electrocardiogram. *A*, normal tracings; *B*, three minutes after the intracarotid injection of nerve gas (convulsive pattern, falling blood pressure, pronounced bradycardia), and *C*, thirty seconds after the intravenous injection of 2.5 mgm. per kilogram of body weight of trasentine(R) methiodide (restoration of normal electroencephalographic findings and circulation).

placing the patient in a prone position, grasping his thighs at the level of the pubis and alternately lifting and lowering his hips 10 to 12 inches. Preliminary trials are said to indicate that this method may effectively ventilate the lungs in cases of flaccid paralysis of the respiratory muscles.[11]

The use of an efficient mechanical resuscitator is probably the most practical and reliable method of giving artificial respiration in these cases, provided that the device can be got to the patient, or the patient to it, before irreversible anoxic damage occurs. A light, portable, hand-powered, bellows type resuscitator may be the most practical for emergency rescue work. Animal experiments indicate that 45 minutes of artificial respiration may be required to restore natural breathing after two or three lethal doses of nerve gas.[12]

If the skin should be splashed with liquid nerve gas, it is important to remove the contamination as soon as possible. The safest and most effective method is to swab the skin immediately with an alkaline fluid. Ammonia water, a 5 to 10% solution of sodium carbonate or a 1 to 2% solution of sodium hydroxide is suitable for this purpose. If none of these is available immediately, any available absorbent material may be damped with water and the area swabbed with this. Swabbing or rubbing the contaminated skin with dry materials must be avoided, as this greatly increases absorption and toxicity. If only dry absorbent material is available, the excess liquid may be gently blotted from the skin, provided wiping and rubbing are carefully avoided, but the contaminated area must be washed with soap and water or swabbed with an alkaline fluid as soon thereafter as possible.[13]

Clothing which is splashed with liquid nerve gas should be removed promptly and left outdoors. Patients should not be admitted to hospitals or other enclosed spaces until all liquid nerve gas contamination of skin and clothing has been eliminated, because the vapours from such contamination will endanger other patients and hospital personnel.

This information may be useful in dealing with poisoning by some of the newer insecticides, notably parathion and tetraethyl pyrophosphate (TEPP), which are also powerful though less dangerous anticholinesterases.[14]

ABSTRACT OF DISCUSSION

Dr. David Grob, Baltimore: The nerve gases are organic phosphate compounds whose pharmacologic and toxic effects arise from their ability to inhibit the cholinesterase enzymes present in all animal tissues. Two compounds in this group are useful therapeutic agents: di-isopropyl fluorophasphate (DFP), in the management of abdominal distension, urinary retention and glaucoma, and tetraethyl pyrophosphate (TEPP), in the management of myasthenia gravis. The toxic effects of the organic phosphate compounds in animals of all species has led to the use of some of them as agricultural insecticides, including parathion (O,O-diethyl O-pananitrophenyl thiophosphate tetraethyl pyrophosphate) and hexaethyl tetraphosphate (HETP). At least six deaths have followed accidental exposure to lethal amounts of parathion, and a few deaths have been due to di-isopropyl fluorophosphate, tetraethyl pyrophosphate and the nerve gases. Although the toxic and lethal doses of parathion, di-isopropyl fluorophosphate and tetraethyl pyrophosphate are larger than those of the nerve gases, and their volatility less, the experience gained with the former compounds has proved in general applicable to the nerve gases and may serve to acquaint the civilian population with the hazards of this group of compounds and to introduce physicians to the problem of recognition and management of their toxic effects. The effects of the nerve gases include muscarine-like, nicotine-like and central nervous system signs and symptoms. Absorption of the organic phosphate compounds may be by any route, and, since they do not produce local inflammatory changes, absorption may be undetected until symptoms begin, unless the cholinesterase activity of the plasma or red blood cells is determined. The danger of these compounds lies not only in the small doses that are lethal but also in the persistent effects of sublethal doses. After absorption of these compounds the cholinesterase enzymes are restored slowly over a period of many days, ap-

parently by the regeneration of new enzyme protein. For several days after exposure and until these enzymes are restored to normal activity, there is increased susceptibility to any repeated exposure. This cumulative action is particularly dangerous because there is only a moderate margin between the doses of these compounds that produce symptoms and the doses that are lethal, so that little or no warning may be given by impending serious effects. It is probable that the cholinesterase activity of the tissues may be considerably reduced before the appearance of warning symptoms, while a further reduction below the level compatible with normal function may result in pronounced symptoms and death. The precise cause of death from the organic phosphate compounds is not yet known, but contributing factors are believed to be depression of the respiratory and circulatory centres in the brain, weakness of the muscles of respiration and, particularly if the respiratory tract is one of the routes of absorption, bronchoconstriction and pulmonary œdema. The treatment of poisoning by these compounds relies chiefly on atropine, and on artificial respiration if respiration fails. Atropine has a moderate inhibitory effect on the muscarine-like manifestations of the organic phosphate compounds and a less striking effect on the central nervous system manifestations. In the presence of moderately severe symptoms due to these compounds, there is an increased tolerance for atropine, so that fairly large doses may be given. Studies are in progress to develop an agent which will block the muscarine-like, the nicotine-like and the central nervous system effects of the organic phosphate compounds more effectively than atropine and to develop a reliable skin decontaminating agent and improved methods of artificial respiration. The group of organic phosphate anticholinesterase compounds is being continually expanded by the synthesis of new, and in some instances, more potent compounds. Some members of this group will be increasingly useful in medicine and in agriculture, while others may someday be used as chemical warfare agents. Appreciation of the properties and hazards of these compounds not only will prevent the harmful results of their careless or indiscriminate use in peacetime pursuits but will also provide a background of preparedness in the eventuality of their use as chemical warfare agents.

Dr. George M. Lyon, Washington, D.C.: Colonel Wood's description of the physiological effects of the new nerve gases is useful because information regarding these effects has not been generally available. I agree with Colonel Wood that chemical attacks on our civil communities are unlikely and that, with the possible exception of the nerve gases, chemical agents do not offer potential enemies effective weapons for long range attack. However, an enemy might decide to use chemicals against combatant forces. Medical personnel must therefore be prepared to meet the problems which may be encountered in such a situation. Chemical warfare medicine has come to be an important phase of military medicine. It has no exact counterpart in civil medicine. In my opinion it is doubtful that the technological developments of modern warfare have in any way altered the basic responsibilities of the medical departments of the armed forces in this respect. The nerve gases, in addition to being highly toxic, pose complicated toxicological problems. These new agents present difficulties of treatment for all but the relatively mild cases. Furthermore, they add to the difficulties of medical logistics. I can visualize the problems which may be encountered in interpreting these new gases to non-medical personnel and in explaining the first aid and therapeutic indications to medical personnel. Medical leadership, well qualified and confidence inspiring, will be essential. During World War II, medical officers were required to discharge a variety of duties in connection with the medical aspects of chemical warfare. Perhaps the most important of these was in connection with medical and toxicological research. Closely allied to this was the assistance the medical officers gave to chemical officers in the interpretation of the medicomilitary significance of various chemical agents and in the preparation of training material relating to the medical aspects of chemical warfare. Medical officers were required in connection with industrial hygiene and care of accidental chemical casualties in plants were toxic chemicals were manufactured and processed, in training medical and non-medical personnel in the medical aspects of chemical warfare and not infrequently in instructing personnel of the line in chemical defence. They served in connection with matters of medical intelligence and chemical warfare intelligence and as specialist advisers in chemical warfare medicine on the staffs of major commands. How to prepare medical officers to meet these varied responsibilities poses a difficult problem. All medical officers should have a broad general knowledge of the medical aspects of chemical warfare, and a limited number should be trained to carry out more advanced or specialized duties of the nature described.

Dr. A. C. Ivy, Chicago: For our recent comparison of the various manual and mechanical methods for resuscitation, my associates and I obtained the bodies of patients without pulmonary disease, and we used the warm, non-rigid corpse to determine the pulmonary ventilation obtained by the various manual and mechanical methods. Normally, inspiration is an active process, and expiration is passive. But, in the corpse or in the apnœic person, force has to be applied to cause either inspiration or expiration; that is, air must be pulled into the lungs or out of the lungs, or both. Some of the various manual methods use the principle of pulling the air into the lungs. In the familiar Schaefer prone pressure method, the air is pushed out, and, as a result of the recoil of the chest wall, air is pulled in. In the Nielsen method, the patient is lying prone, and the operator lifts the arms, thus pulling the air into the lungs; then he drops the arms and presses down lightly on the scapulas, pushing the air out. If a combination of the Schaefer, Nielson and Drinker methods is used, with two operators, one operator lifts the arms to pull air in, and the other uses the Schaefer prone pressure method and pushes air out. If a combination of the Schaefer and the Emerson method is used, the operator pushes on the chest and then lifts or rolls the hips, which pulls air into the lungs. This is a combination of push and pull. When all the data on the manual methods were averaged and tabulated, it was found that those methods which use either a push or a pull procedure yield only one-half the pulmonary exchange obtained by a procedure which involves both push and pull. Otherwise, no statistically significant difference was found between the amounts of ventilation obtained by the various manual methods. The Emerson procedure is not a new one. It was suggested a number of years ago by Guy Thompson and several others; nevertheless, it was rediscovered by Emerson. The patient lies prone, and the operator assumes the position of the Schaefer prone pressure method and then lifts or rolls the hips of the patient. This procedure has been modified so that the operator assumes the Schaefer position (demonstrating position) and places his left knee next to the patient's left hip and his right foot next to the patient's right hip with the right leg flexed on the thigh; then he grasps the patient's hip bone on each side. In this position it is possible to lift or to roll the hips by lifting the right hip of the patient. We have found that is is necessary to lift the hips only 4 inches. In order to avoid fatigue due to lifting the hips, the right hip should be lifted in a rolling manner. Here the roll is caused by lifting with the right arm. When the right arm becomes tired, the left arm can be used. Lifting or rolling the hips yields a tidal air of around 225 c.c. But, if this procedure is used and then pressure is applied to the loin or the lower thorax, as in the Schaefer prone pressure method, a tidal air of about 500 c.c. will be obtained. The important point is that with a free airway any manual method which combines a push and pull procedure yields a tidal air of about 500 c.c. Mechanical respirators, when operated at the recommended rate and the recommended pressure, will yield a minimum volume per minute of about 5,000 or 6,000 c.c., or the same amount which can be obtained with a combination of the manual push and pull procedures. Ventilation of 5,000

or 6,000 c.c. per minute is sufficient; greater amounts will produce the undesirable effects of hyperventilation.

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CORTISONE IN THE TREATMENT OF LEUKÆMIA

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SINCE the introduction of cortisone by Hench and his co-workers, some evidence has been produced to show that the drug may act to inhibit the lymphocytic elements in the body. With this in mind, two cases of lymphatic leukæmia in children and a case of acute lymphatic leukæmia in an adult were treated with cortisone. A case of acute myelogenous leukæmia in a child was also treated.

CASE 1

O.P., aged 3½ years. This male patient was referred to the Saskatoon Cancer Clinic on June 10, 1950. The mother gave a history of noting a lump on the right side of the baby's neck, which increased slowly in size for two months. For two weeks prior to admission she had noticed a listlessness and loss of appetite. Physical examination showed a normally developed child with a sallow complexion who cried a great deal. There were three large nodes in the right posterior cervical chain, the largest being 3 cm. in diameter. These were discrete and rubbery. There were numerous pea-sized nodes in both supraclavicular triangles and in the left posterior cervical chain as well as in both axillæ and groins. The liver was enlarged one finger below the costal margin and the spleen was down two fingers. The remainder of the examination was negative.

Laboratory findings showed: hæmoglobin, 24%; red blood cells, 1,330,000; white blood cells, 12,500; lymphocytes, 81%; prolymphocytes, 9%; polymorphonuclears, 1%; rhabdocytes, 6%; platelets, 360,000. A sternal puncture showed: lymphocytes, 94%; prolymphocytes, 5%. No blast forms were seen.

A diagnosis of lymphatic leukæmia was made and 900 mgm. of cortisone were administered in seventeen days as shown in Table I. At no time was any reduction in size of spleen, liver or nodes observed.

COMMENT

(1) No evidence of increase in erythroblastic activity was shown. The red blood count continued to fall and reticulocyte counts remained low. (2) No significant change was noted in the white blood cell pattern, but there was a drop in the total white blood count from 15,000 to 1,600. (3) No significant clinical improvement was observed. (4) No evidence of cortisone toxicity was observed.

CASE 2

L.M., aged 2½ years, male. This patient was admitted to the Regina Cancer Clinic with a history of irritability, paleness, anorexia and increasing size of the abdomen, all of two weeks' duration.

Examination showed the skin and mucous membranes to be quite pale. The spleen was enlarged medially to the midline and descended three fingers below the costal margin. Numerous discrete rubbery nodes ranging in size up to 1.5 cm. were noted in both posterior cervical triangles as well as both axillæ and groins. Hæmatological examination showed: hæmoglobin, 32%; red blood cells, 1,057,000; white blood cells, 76,350; polymorphonuclears, 1%; lymphocytes, 92%. No blast forms were seen. The patient was given 500 c.c. of blood and transferred to the Saskatoon Cancer Clinic for treatment. A total dose of 900 mgm. of cortisone was given over a period of nineteen days with daily dosages and blood changes shown in Table II.

Tibial punctures were done before and after treatment.

	Before treatment	*After treatment*
Hæmoglobin	40%	67%
Red blood cells	2.1	3.4
White blood cells	36,000	10,450
Colour index	0.93	0.99
Lymphocytes	91.0	62.4
Prolymphocytes	7.0	4.7

PROGRESS NOTES

May 18.—The general good condition remained until sixteen days after completion of treatment when the patient developed a fever of 105, became restless, taking food poorly and developing pain in the right knee which was held in a position of flexion and felt quite warm. X-ray films revealed no evidence of osteomyelitis or periosteal reaction as seen in leukæmia. The liver and spleen were unchanged, but the lymph nodes which had disappeared were again enlarged. A course of penicillin was started, giving 500,000 units daily for six days.

May 22.—The patient is able to stand on both legs; the liver and spleen show an increase in size.

June 2.—The abdomen is markedly distended due to an increase in the size of the liver and spleen. His general condition appears to be deteriorating.

June 7.—Hæmoglobin, 70%; white blood count, 18,500; lymphocytes, 42%; prolymphocytes, 8%.

June 13.—Hæmoglobin, 41%; white blood count, 61,000.

June 21.—Hæmoglobin, 23%; white blood count, 93,000. A second course of cortisone was started giving 100 mgm. daily in divided doses. This was given for three days at which time the patient died.

TABLE I.

Date	Hæmoglobin	Red blood count	Reticulocytes	White blood count	Lymphocytes	Prolymphocytes	Polymorphonuclears	Rhabdocytes	Eosinophiles	Notes
June 12	55	2.8	0	15,000	49		5	33	5	Cortisone 25 mgm. x 4.
June 13	54	2.7	0.1	9,950	61	4	8	22	11	Cortisone 25 mgm. x 4 Sed. rate 115 Alb. 3.8. gr. Glob. 3.0.
June 14	48	2.4	0	8,400	42	4	9	39	0	Cortisone 25 mgm. x 4.
June 15	53	2.8	0.1	8,800	43	4	9	38	5	Cortisone 15 mgm. x 4.
June 16	57	2.9	0	7,950	61	3	7	25	11	Cortisone 15 mgm. x 4 Sed. rate 121 Alb. 3.4. Glob. 2.9.
June 17	50	2.6		5,450	50	3	11	33	16	Cottisone 15 mgm. x 4.
June 20	50	2.7	0.7	5,200	61	3	6	27	0	Cortisone 15 mgm. x 4 Bl. uric acid 3.3 mgm. Sed. rate 102.
June 21	38	2.1	0.6	2,650	60	5	6	22	0	Cortisone 15 mgm. x 4.
June 22	41	2.0	0.5	3,300	71	3	8	13	5	Cortisone 15 mgm. x 4.
June 24	39	1.9	1.0	2,300	85	1	2	7	0	Cortisone 15 mgm. x 4.
June 26	40	2.0	1.7	2,200	82	1	7	1	5	Platelets 210,000.
June 27	42	2.3	2.0	1,800	84	5	2	3	0	Cortisone 15 mgm. x 4.
June 28	39	2.0	2.5	1,600	76	2	1	12	0	Cortisone 15 mgm. x 4 Platelets 200,000. 200 c.c. blood given.

TABLE II.

Date	Hæmoglobin	Red blood count	White blood count	Lymphocytes	Prolymphocytes	Polymorphonuclears	Rhabdocytes	Eosinophiles	Platelets	Notes
14-4-50	39	2.4	13,800	76	8	3	10	170	130	Cortisone 50 mgm. x 2.
15-4-50	42	2.2	10,500	76	7	3	11	66	90	Cortisone 50 mgm. x 2 Upper respiratory infection. Temp. 106°. Chest x-ray neg.
16-4-50	38	2.0	5,850	37	4	17	42	16	84	Cortisone 50 x 2.
17-4-50	33	1.8	2,700	31	3				70	Cortisone 25 mgm. x 2. General condition improved.
18-4-50	29	1.6	2,950	55	2	10	31	0	80	Cortisone 25 mgm. x 2 Testicles hard but not enlarged.
19-4-50	26	1.4	3,200	58	5	9	6			Cortisone 25 mgm. x 2. No change in nodes or spleen.
20-4-50	29	1.5	3,600	68	4	14	13			Cortisone 25 mgm. x 2.
21-4-50	27	1.5	4,500	64	4			11	80	Cortisone 25 mgm. x 2.
22-4-50	25	1.3	5,150	63	7	16	10		100	Cortisone 25 mgm. x 2.
23-4-50	27	1.5	3,250	57	8			5	105	Cortisone 25 mgm. x 2. Slight diminution of nodes and spleen.
24-4-50	30	1.5	3,250	64	6			0		Cortisone 25 mgm. x 2. Pallor increasing.
25-4-50	26	1.4	3,000	60	3			0	95	250 cc. blood given. Cortisone 25 mgm. x 2.
26-4-50	44	2.2	3,350	58	6			16	105	Cortisone 25 mgm. x 1.
27-4-50	50	2.6	4,600	64	3			0		Cortisone 12.5 mgm. x 1.
28-4-50	51	2.5	3,800	69	3			0	110	
29-4-50	53	2.7	3,950	77	3			0	105	Color and general condition very much better. 250 c.c. blood.
30-4-50	66	3.3	5,600	80	4			0		Cortisone 25 mgm. x 1
1-5-50	63	3.3	4,900	79	4			0	90	Cortisone 12.5 mgm. x 1. Nodes not palpable. Liver and spleen unchanged.
2-5-50	65	3.3	4,350	84	4			5		Cortisone 125 mgm. x 1. Alert and active.

Autopsy showed marked leukæmic infiltration of the liver and spleen as well as massive involvement of both kidneys and testicles.

COMMENT

(1) The hæmoglobin continued to fall rapidly, abetted by an upper respiratory infection. This necessitated the giving of two transfusions of 250 c.c. on the 12th and 16th day of treatment. (2) There was a continued fall of the circulatory lymphocytic elements from 13,800 to 4,350. (3) No significant change in the white blood count pattern was observed. (4) Cervical and axillary lymph nodes disappeared. (5) There was a slight and insignificant diminution of the spleen and liver noted on the tenth day of treatment. (6) There was an improvement in the patient's general well being which may well have been brought about by the blood transfusions.

CASE 3

P.W.S., aged 44. Admitted to the Saskatoon Cancer Clinic on March 31, 1950, complaining of tightness and a constant dull ache in the epigastrium which began six weeks previously. The episodes would last three to four days with intervals of freedom lasting from one to two days. He lost three pounds in the six weeks; his appetite was good, but he seemed to "fill up" easily. There was no nausea or vomiting or recent change in bowel habits.

Examination showed slight distension of the abdomen with the liver and spleen just palpable on deep inspiration. A mass the size of a grapefruit was palpable lying between the umbilicus and the right inguinal ligament. It was firm in consistency and seemed to be fixed deeply and was not tender. There were no palpable lymph nodes and the remainder of the physical examination was negative.

X-ray findings—on examination of the bowel by barium enema, an extrinsic pressure defect was reported, involving the terminal ileum and cæcum. X-ray examination of the chest was negative.

Laboratory findings showed: hæmoglobin, 77%; red blood count, 3,990,000; white blood count, 21,750; colour index, 0.98; polymorphonuclears, 18%; rhabdocytes, 7%; lymphocytes, 30%; prolymphocytes, 44%; sedimentation rate, 35 mm. hr. Paul Bunnell negative. Kahn doubtful. Wassermann negative. Sternal puncture showed lymphocytic leukæmic infiltration of the bone marrow. With these findings, a diagnosis of chronic lymphatic leukæmia was made.

Abdominal irradiation was administered, using the trunk bridge technique and 670 r tumour dose was delivered in eleven days. The white blood count on completion of treatment was 5,850.

One month follow-up.—The patient was complaining of pain below the right costal margin and the appearance of lumps in the axillæ and groins which had grown rapidly in size during the preceding week. Examination showed the spleen enlarged four finger breadths below the costal margin and the previously described abdominal mass had also increased. Numerous nodes one to four cm. in size were noted in both axillæ and groins with smaller nodes in both cervical and supraclavicular areas. On x-ray examination of the chest, a small collection of fluid in the left base was shown. The blood count showed: hæmoglobin, 60%; red blood count, 3,000,000; white blood count, 75,000; polymorphonuclears, 17%; rhabdocytes, 12%; lymphocytes, 28%; prolymphocytes, 42%; platelets, 125,000. Bleeding and clotting time were normal.

Because of the falling hæmoglobin, rising white blood count, with a rising percentage of prolymphocytes, it was felt that the patient was entering an acute phase of the disease, and further radiotherapy was contraindicated. This opinion was substantiated by the appearance of lymphoblasts in the peripheral blood within a few days.

A trial of cortisone therapy was begun on June 2, with a dosage of 50 mgm. every six hours for a total of 1.3 gm. The full course of therapy was terminated by death on the sixth day of treatment. A summary of the blood findings as shown in Table III.

COMMENT

Treatment with cortisone did not alter the rapidly fatal course of the terminal phase of lymphatic leukæmia in this adult.

CASE 4

This patient was admitted to the Saskatoon Cancer Clinic on August 10, 1949, with the following past history: In March, 1949, the patient developed a severe tracheobronchitis necessitating a tracheotomy. Following this, he developed severe recurrent nosebleeds which were difficult to control. The blood picture at that time showed: hæmoglobin, 59%; red blood count, 3,200,000; white blood count, 28,450; polymorphonuclears, 48%; rhabdocytes, 32%; lymphocytes, 14% and no blast forms. The platelet count was 45,000. Repeated blood counts showed the presence of a constant thrombocytopenia and

TABLE III.

Date	*Hæmoglobin*	*White blood count*	*Lymphocytes*	*Prolymphocytes*	*Lymphoblasts*	*Polymorphonuclears*	*Rhabdocytes*	*Reticulocytes*	*Platelets*	*Eosinophiles*	*Notes*
2-6-50	53	138,000	18	62		10		3.1	100,000	11	Cortisone 50 mgm. x 4.
3-6-50	51	160,000							95,000	11	Cortisone 50 mgm. x 4. 500 c.c. blood.
4-6-50	56	163,000	17	54	7	7	6			0	Cortisone 50 mgm. x 4.
5-6-50	56	161,000	20	63	3	4	5	3.1	70,000	6	Cortisone 50 mgm. x 4. 500 c.c. blood.
6-6-50	53	119,000	9	62	9	4	12		90,000		Cortisone 50 mgm. x 4.
7-6-50	60	123,000	13	65	9	5	6	1.5		16	Cortisone 50 mgm. x 4. Uric acid 7.9 mgm. Alb. 2.5 Glob. 2.2.
8-6-50	61	165,000	17	60	7	8	4	1.7		0	Cortisone 50 mgm. x 4. Patient died.

because of this, the spleen was removed, the diagnosis being thrombocytopenic purpura. Following the operation, the platelet count rose to 125-150,000 and has persisted at this level. The bleeding tendencies were not controlled.

Physical examination on August 10, 1949, showed a well developed and fairly well nourished child with a pale complexion. There were a few small discrete mobile lymph nodes in the neck, each axilla and in both groins. The liver was just palpable. The spleen had been previously removed. There were numerous ecchymoses about the forearms and one on the left upper eyelid.

On admission to clinic, the following blood picture was found: hæmoglobin, 47%; red blood count, 27,000,000; white blood count, 112,000; colour index, 0.87; polymorphonuclears, 18%; rhabdocytes, 57%; metagranulocytes, 4%; granulocytes, 3%; progranulocytes, 1%; lymphocytes, 9%; platelets, 100,000. Bleeding time, 4 minutes; clotting time, 3 minutes. A sternal puncture showed granulocytic leukæmic infiltration of bone marrow. A diagnosis of myelogenous leukæmia was made and a course of aminopterin was carried out, but was discontinued because an adequate response was not obtained. He was carried along with frequently repeated blood transfusions until cortisone became available. One gram was administered over a period of 18 days (50 mgm. twice daily) with blood counts as noted in Table IV.

A survey of the results showed no evidence of clinical improvement. A falling hæmoglobin and no increase in the reticulocyte counts would seem to indicate that there was no increase in erythroblastic activity attributable to the drug. There was no reduction in the total white cell count nor any improvement in the cellular distribution of the leukæmic elements.

SUMMARY

Two cases of lymphatic leukæmia and one case of myelogenous leukæmia in childhood as well as a case of acute lymphatic leukæmia in an adult have been presented.

Treatment of these cases with cortisone did not seem to alter significantly the clinical picture or hæmatological findings in the dosages used.

The financial assistance of the National Research Council for the purchase of cortisone is gratefully acknowledged. Thanks are extended to Dr. J. W. Adams and his laboratory staff at the City Hospital, Saskatoon, and to Dr. J. F. C. Anderson, chairman of the local cortisone committee for their assistance as well as to Dr. W. S. Kinnear, Dr. U. J. Gareau, and Dr. J. Cumming for referring these cases to the Saskatoon Cancer Clinic. Dr. T. A. Watson, Director of the Saskatoon Cancer Clinic has been an ever present source of help in the carrying out of these treatments.

TABLE IV.

Date	*Hæmoglobin*	*Red blood count*	*Reticulocytes*	*White blood count*	*Polymorphonuclears %*	*Rhabdocytes*	*Metagranulocytes*	*Myelogranulocytes*	*Lymphoblasts*	*Lymphocytes*	*Platelets*	*Eosinophiles*	*Notes*
May 17	40	2.2	0.6	76,000	7	44	14	4	2	10	125,000	1,100	Cortisone 50 mgm. x 2.
May 18	41	2.2	0.3	67,000	8	43	7	5	0	16	150,000	1,100	Cortisone 50 mgm. x 2.
May 19	43	2.7		80,000	5	53	8	4	1	10	180,000	506	Cortisone 50 mgm. x 2.
May 20	40	2.1	1.2	88,000	9	50	6	7	1	6	180,000	220	Cortisone 25 mgm. x 2.
May 21	39	2.0		100,000							160,000	198	Cortisone 25 mgm. x 2.
May 22	44	2.2	0.6	138,000	7	49	7	8	1	8		192	Cortisone 25 mgm. x 2.
May 23	42	2.1		142,000	7	54	5	8	1	7	85,000	242	Cortisone 25 mgm. x 2.
May 24	41	2.0		160,000	8	50	6	6	1	9	110,000	264	Cortisone 25 mgm. x 2.
May 25	48	2.4	0.5	173,000	6	48	9	9	1	6		605	Cortisone 25 mgm. x 2.
May 26	36	1.9		168,000	6	44	9	7	2	6	95,000	572	Cortisone 25 mgm. x 2.
May 27	38	1.9	0.2	171,000	8	47	4	7	1	8	80,000	594	Cortisone 25 mgm. x 2.
May 28	34	1.8		151,000	7	53	6	5	1	8	110,000	610	Cortisone 25 mgm. x 2.
May 29	38	2.0	0.4	137,000	9	49	4	4		5		440	Cortisone 24 mgm. x 2. 250 c.c. blood.
May 30	58	3.0		179,000	14	53	4	2	1	3	140,000	440	Cortisone 25 mgm. x 2.
May 31	57	2.9	0.1	141,000	11	55	7	4	0	3	140,000	649	Cortisone 25 mgm. x 2.
June 1	61	3.0		142,000	13	51	4	4	1	2		913	Cortisone 25 mgm. x 1.
June 2	56	3.0		150,000	11	49	7	8	0	3	115,000		Cortisone 25 mgm. x 1.
June 3	53	2.8			12	44	6	7	2	6	100,000		
June 4	52	2.7			9	50	7	6	2	5	120,000		Cortisoue 25 mgm. x 1.

TREATMENT OF LEUKÆMIA WITH CORTISONE

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THE effect of adrenal cortical hormones on hæmatopoietic tissue was first shown by Dougherty and White in 1943 who were able to demonstrate a marked reduction in the total number of circulating lymphocytes and the amount of lymphoid tissue in animals whose adrenal cortex had been stimulated by the administration of adrenocorticotropic hormone.[1] This has been confirmed in humans, and other hæmatological effects, principally a marked fall in circulating eosinophils and a rise in circulating neutrophils, have also been shown.[2, 3] These effects are believed to be produced by the "S" hormones of the adrenal gland, one of which is Kendall's compound E or cortisone.[2]

On the basis of the experimental results one might expect that either adrenocorticotropic hormone (ACTH) or cortisone would have a favourable effect on certain diseases of lymphoid tissue such as lymphatic leukæmia, lymphosarcoma, Hodgkin's disease and others.

Pearson *et al.* have reported temporary remissions produced by ACTH or cortisone in cases of chronic lymphatic leukæmia and lymphoma.[4] Remissions have also been reported in cases of acute lymphatic leukæmia in children treated with ACTH.[5, 6] Reports have also appeared in which poor responses in acute leukæmia in children were obtained with cortisone.[7] Results vary also with granulocytic leukæmias. Some[6] have reported a favourable response and others[8] have reported no benefit.

We have treated 5 cases of leukæmia of various types with cortisone. All of the cases treated were acute or subacute; three were children, and two were adults. The response to treatment has varied greatly, and we believe these cases illustrate some of the problems which arise in the treatment of leukæmia with cortisone. We have not used ACTH in leukæmias; however, the findings probably also apply in essence to the use of this hormone.

CASE 1

F.B., female, aged 4 years. This patient was transferred to the University Hospital with a diagnosis of acute lymphatic leukæmia made on the basis of a week's history of anorexia, weakness and severe nose bleeds, and physical findings of anæmia, generalized lymphadenopathy, and gross hepatomegaly. The clinical findings were confirmed by blood studies which showed a leucocyte count of 25,000 with 76% mononuclear cells, many of which were blast forms. The platelet count was 50,000. Her hæmoglobin was 5.4 gm.

Following two transfusions of 250 ml. each, she was transferred to the University Hospital for treatment and study, using cortisone. On admission here her physical findings were similar to those described above. Her liver was massively enlarged and extended to the level of the umbilicus. The spleen was questionably palpable. She had a leucocyte count at this time of 3,400 and only occasional blast cells could be found. Her hæmoglobin was 9.2 gm. per 100 ml. A lymphnode biopsy was reported as malignant lymphoblastoma. A bone marrow biopsy showed a marked increase in lymphocytes and blast cells.

Cortisone therapy was commenced ten days after her first admission, using 25 mgm. twice daily. Her leucocyte count at this time was 1,750, and her platelet count 138,000. With this therapy she showed progressive improvement with increased appetite, increased interest in her surroundings, and a most robust appearance. The lower border of her liver had receded to the costal margin by the end of the second week of treatment. At the same time the enlarged lymphnodes had decreased in size so that they were no longer palpable. The total lymphocyte count remained about the same, but there was a marked increase in neutrophils (Fig. 1). Platelets increased to an extremely high level of 1,950,000 (Fig. 2).

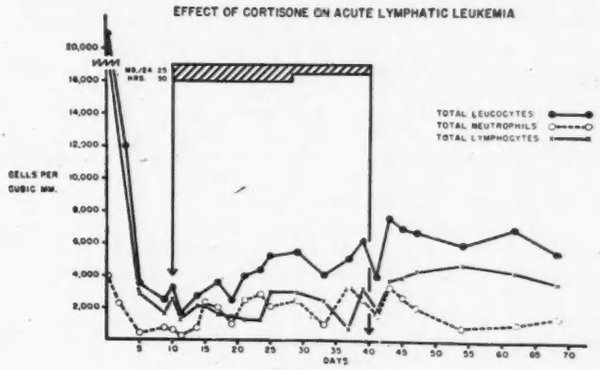

Fig. 1

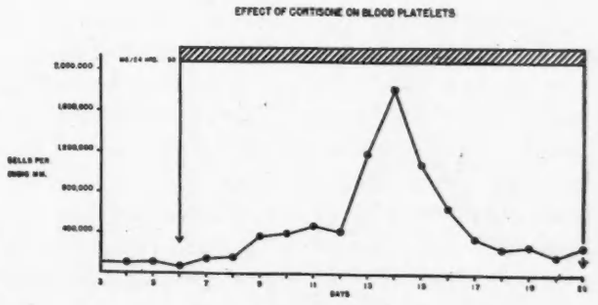

Fig. 2

On the eighteenth day of treatment another lymphnode biopsy and bone marrow biopsy were done. Some difficulty was encountered in finding a lymphnode at this operation. The histology of this lymphnode showed a striking contrast to the one previously examined. Although the normal structure was gone, some poorly defined germinal centres were developing. The bone marrow showed a marked change from the previous examination. Although lymphocytes still made up 27% of the marrow cells, only occasional blast cells could be found. The biopsy incision healed in a normal fashion.

The dosage of cortisone was reduced after the second biopsy to 25 mgm. per day, and she was continued on this dosage for two weeks. She was discharged on her forty-seventh hospital day, five days after treatment was discontinued, to report back at weekly intervals for follow-up studies. Her general condition on discharge

was excellent; she had gained seven pounds while in hospital and appeared quite robust and plump. Liver, spleen and lymphnodes were not palpable on discharge. Her hæmoglobin had climbed to 12 gm.; her white blood cell count was 6,850 with a moderate relative lymphocytosis of 63%. Her platelet count was 250,000 (Figs. 1 and 2).

Two weeks after discharge on her second follow-up visit some small posterior cervical lymphnodes were palpable. The liver or spleen could not be felt. She had continued in good health. On two subsequent visits, three and four weeks respectively after discharge, the lymphadenopathy had steadily increased, appearing first in the anterior and posterior cervical chains and then in the axillæ and groins. The liver was palpable two inches below the costal margin on the last admission, and the spleen was just palpable at the same time. There was also a diffuse enlargement of the parotid glands. The white blood cell count had risen to 15,950, 93% of which were lymphocytes. Her hæmoglobin was 13 gm. Throughout the period of the development of this recurrence she remained otherwise in excellent health with a good appetite and normal activities and interests.

She was readmitted one month after discharge. At this time her lymphadenopathy and hepatomegaly had returned to about the same stage as when she was seen originally. She showed a moderate swelling over both parotid glands. Her hæmoglobin was 12.6 gm. and her white blood cell count was 15,100, with 70% lymphocytes. The parotid swellings were treated with 370 roentgens of deep x-ray to each side and subsided rapidly. Her leucocyte count fell during treatment to 3,080 with 65% lymphocytes. She was kept under observation for two weeks, but no further therapy was undertaken. She was discharged and asked to report back in two weeks, at which time it was hoped that her hæmatological picture would be more stable and the effect of further therapy could be better evaluated.

She returned in two weeks after an episode described as the "flu", for which she had been hospitalized and given penicillin. Her hæmoglobin at this time was 7.9 gm., and her white blood cell count 7,900, of which 79% admission the following week was recommended, but the parents failed to bring the child in. Word had reached us a month after she was last seen that her condition was slowly deteriorating.

This case illustrates a favourable response to cortisone. Almost a complete remission of the disease was obtained, although this remission lasted only a few weeks. The most interesting features are: (1) the dramatic reduction in the liver and lymphnode enlargement; (2) the almost complete reversal of the bone marrow picture, and (3) the very marked increase in platelets which reached almost two million after eight days of treatment.

CASE 2

J.T., female, aged 4 years. A case of subacute lymphatic leukæmia showing marked leukæmic infiltration of the skin and skeletal involvement.

Patient was admitted with a diagnosis of subacute lymphatic leukæmia which had been established in another hospital two months previously. On admission the child was markedly emaciated, very pale and weak, and semicomatose. There were many nodules up to 2 cm. in diameter in the skin over the scalp, and smaller nodules in the skin over the chest. There was moderate generalized lymphadenopathy; the spleen and liver were just palpable. Her hæmoglobin was 6.3 gm.; her white blood count 3,100, and moderate numbers of blast forms were observed on the peripheral blood smear. Platelets were greatly reduced.

Five days after admission a bone marrow biopsy and biopsy of the cutaneous nodule on the scalp were done. The bone marrow was almost entirely replaced by blast cells. The skin biopsy was reported as leukæmia cutis. X-ray of both legs showed leukæmic involvement of the shafts of the long bones.

Cortisone in a dosage of 25 mgm. twice daily was commenced on her sixth hospital day. This was later increased to 50 mgm. twice daily. She received a total of 875 mgm. over a period of eleven days. She also received during this period 400 ml. of blood, 400,000 units of penicillin daily, and sedation as required.

Her clinical response was poor. There was no appreciable change in her condition other than that which might be attributed to her blood transfusions. She oozed blood frequently from her nose, ate little, and complained of pain in her arms and legs. Her hæmatological response to this therapy was not favourable, and there was a fall in the number of all cell types in the peripheral blood. The total leukocyte count fell from 2,750 to 1,600, and there was a progressive fall in hæmoglobin and erythrocytes. Two days after the cortisone was discontinued she appeared brighter than she had been at any time since admission. This lasted only a day, and she lapsed into her previous moribund state.

Her course was progressively downhill. She received 2,350 ml. more blood in the subsequent four weeks. The nodules in the scalp and the lymphadenopathy disappeared gradually, but the bony changes remained. She developed evidence of further infiltration in her right lung base, and also developed massive decubitus ulcers. Death occurred 43 days after admission.

At autopsy little lymphatic tissue could be found. There were multiple metastatic abscesses which were believed to have originated in the infected bedsores. Histological examination of the bone marrow showed only multiple small abscesses, fibrosis, and an increase in lymphocytic elements. The lymphnodes were very vascular, and, although no normal follicles could be seen, the peripheral sinus was well preserved and the lymphocytic elements were greatly reduced in number.

This case showed no significant clinical response to cortisone. There was, however, a disappearance of the lymphnode enlargement and the leukæmic infiltrations in the skin after the therapy was discontinued. There was also a marked regression of the malignant features histologically.

The difference in the response in these cases is striking. What this difference is due to we are unable to say. Case J.T. had had her disease, so far as is known, for a longer time and was in a very debilitated state. She showed a persistent leukopenia and her bone marrow was almost completely replaced by blast cells. The disease in Case F.B. on the other hand was of short duration when first treated, and the patient was very well nourished. She also had a leukopenia when treatment was first started, but her bone marrow showed only partial replacement with blast cells. Case J.T. showed only slight enlargement of her liver and spleen in contrast with the gross liver enlargement of Case F.B. It may be that the stage in the disease when treatment is started is important. The possibility that the case which responded well

was proceeding towards a spontaneous remission when therapy was started cannot be definitely excluded.

MYELOGENOUS LEUKÆMIA

We have treated one case of acute monocytic (myelogenous type) leukæmia. The fundamental experimental evidence would suggest that the response would not be favourable; nevertheless it was felt that it should be tried in view of the fact that there remains in the literature some difference of opinion as to the classification of monocytic leukæmias. We were also interested in the possible synergistic effect of cortisone and the folic acid antagonist, 4 aminopterolylglutamic acid (aminopterin).*

CASE 3

G.M., male, aged 21 years. This patient was first seen with a three-week history of diarrhœa, general malaise, intermittent fever and thirty pounds weight loss. He was passing about six loose stools a day, and had a slight cough productive of a small amount of bloody sputum. His temperature was 99.2°.

Physical examination revealed hypertrophy of the gum margins. There was no palpable lymphadenopathy, hepatomegaly, or splenomegaly. There was some tenderness over the descending colon.

Laboratory data showed a hæmoglobin of 8.2 gm., red blood cell count of 3.1 M. and a white blood cell count of 108,000. The cuff test for capillary fragility was markedly positive; the platelet count was 152,000 and bleeding and clotting times were normal. The peripheral blood smears showed 2% blast forms and 64% primitive monocytoid cells. Myelocytes of all types numbered 11%, adult neutrophils 17% and lymphocytes 6%. Bone marrow biopsy showed 50% of the cells to be monocytoid cells, similar to those seen in the peripheral blood, and 14% to be blast cells. Acute leukæmia was diagnosed and classified as the monocytic variety of myelogenous leukæmia.

Stool examinations were negative for blood, and no pathogenic organisms were found. The rectal mucosa protruded from the anus, and sigmoidoscopy revealed marked generalized mucosal hypertrophy.

His hæmoglobin was maintained at over 9 gm. by repeated transfusions, and he was treated with 4 aminopterolylglutamic acid (aminopterin) 1 mgm. daily. A satisfactory hæmatological response was obtained with a fall in circulating leucocytes to 33,000 by the sixth day and a further fall to 13,800 in two weeks. This decrease in numbers was due almost entirely to a fall in monocytoid cells, and blast cells were not significantly altered.

After 17 days' treatment with aminopterin, cortisone was started to see if a further response could be obtained with a combination of the two. A dose of 200 mgm. of cortisone was given daily for two days. This resulted in a drop in temperature from a daily high of 103° to a daily high of 99.4°, but failed to produce a fall in the number of circulating eosinophils. The dose was therefore increased to 600 mgm. per day for two days, and then to 1,000 mgm. for one day. With these large doses his eosinophil count rose from 85 to 262 per c.mm., and no further response was produced clinically. The cortisone was therefore discontinued. During this therapy his total leukocyte count rose to a high of 71,000. The cell morphology and distribution in the peripheral blood was not appreciably changed from that seen after the use of aminopterin alone.

The laboratory data are tabulated in Table I. The hæmoglobin was maintained fairly adequately by transfusions. The serum uric acid which had risen on aminopterin continued to rise when on cortisone, while the excretion of uric acid increased to more than double the pretreatment level. An elevated serum alkaline phosphatase was not affected by therapy. Levin[9] showed a decreased excretion of 17-ketosteroids in five of eight cases of leukæmia, one of which was an acute monocytic type. This case also showed low values throughout, and the excretion was not altered by the administration of the cortisone or aminopterin.

The patient died the day after the cortisone was discontinued. At autopsy the findings were typical of those of acute monocytic (myelogenous) leukæmia, and in addition a diffuse ulceration of the mucosa of the large bowel was found.

This case is illustrative of the poor response which is obtained with the use of cortisone in acute monocytic leukæmia. This would support the concept that monocytoid cells in this case are closely related to myeloid elements and that some cases of monocytic leukæmia are truly a type of myelogenous leukæmia. Aminopterin and cortisone did not appear to have any synergistic effect in this case.

It has been reported that with the administration of cortisone in large doses there is a con-

* Aminopterin—supplied by Lederle Laboratories.

TABLE I.

ACUTE MONOCYTIC LEUKÆMIA—TREATMENT WITH CORTISONE

Case G.M.

Date—February	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*
Hæmoglobin gm./100 ml.	9.2	9.2	10.6	12.2	13.8	13.0	13.4	8.6	6.2
White blood count cells/c.mm.	24,700	17,900	33,000	30,650	39,700	48,000	36,000	71,000	40,000
Eosinophils/c.mm	96	99	113	83	99	138		262	132
E.S.R. (Cutler) mm./hr.	24			25				29	
Urine uric acid mgm./24 hr.				474			1,064		
Blood N.P.N. mgm./100 ml.	25			51				94	
Serum uric acid mgm./100 ml.	7.3			11.2				14.0	
Serum alkaline phosphatase (Bodansky units)	18.25			24.4				12.0	
17-ketosteroids	6.2			4.1			5.4		
Aminopterin	1 mgm.			1 mgm.		1 mgm.	1 mgm.	1 mgm.	1 mgm.
Cortisone mgm.				200	200	600	600	1,000	0

comitant increase in the 17-ketosteroid excretion which is believed to result from the excretion of some of the cortisone as a 17-ketosteroid. Although this patient was on a large dose of cortisone his 17-ketosteroid excretion was not significantly altered. The explanation for this is not clear. Another interesting feature in this case is that even with the large doses of 600 mgm. a day there was not a fall in the eosinophil count.

We have also treated two cases of undifferentiated leukæmia, one in an adult, and one in a child. In both these cases we were unable to make a definite diagnosis as to type. The cortisone treatment in the first case was combined with aminopterin, and in the second case it was given alone.

CASE 4

H.H., female, aged 32 years. This patient was diagnosed as subacute leukæmia, probably myelogenous, four months before admission. During the period of her illness she had been given multiple blood transfusions. She developed a bilateral suppurative parotitis which was surgically drained and treated with antibiotics, although no organism was formed. On admission to University Hospital her temperature was 104° F., and there was moderate pallor. There was a dry scaly erythema of the forehead, face, neck and upper part of the chest. Purpuric lesions were generalized and particularly marked on the lips, and some lesions on the face had the appearance of leukæmic infiltrations. There was moderate general lymphadenopathy and some moderate enlargement of the spleen.

The leucocyte count was 205,000 and hæmoglobin 5.7 gm. Platelet counts ranged from 94,000 to 110,000. The blood smears showed 85% of nucleated cells to be blast forms which appeared to show some differentiation towards lymphocytes. The developmental pattern, however, was not clear cut. A bone marrow biopsy confirmed the findings in the peripheral blood. She received large doses of penicillin throughout her hospital course and blood transfusions in the amount of 3,000 ml. Aminopterin, 1 mgm. daily, was given for six days, and on the last three days of aminopterin therapy she was given 300 mgm. of cortisone daily. It was felt that if a favourable response could be obtained there would be some indication of it within this period of treatment. The only response to cortisone therapy was a drop in her temperature to normal on the first day for a period of a few hours at midday. By evening it had again risen to over 101°, and remained elevated until a few hours before death, which occurred the day after cortisone was discontinued.

CASE 5

K.D., male, aged 2 years, 7 months. This child's illness probably commenced about six months before he was seen by a physician. His parents noted during this period that he had a tendency to bruise and bleed easily although he did not appear to be sick. Medical advice was sought because of severe bleeding from a cut toe one month before admission to this hospital. At that time a diagnosis of acute leukæmia was entertained on the basis of slight hepatomegaly and splenomegaly, anæmia, thrombocytopenia, and a moderate leukocytosis with a few blast forms in the peripheral blood smear. He received two transfusions of 250 ml. each, and was sent to this hospital for consideration of cortisone therapy.

Physical examination on admission showed marked pallor, generalized lymphadenopathy, slight hepatomegaly and gross splenomegaly. The lower pole of the spleen was down almost to the left iliac crest, but the right border did not reach the midline. The temperature was 101° F., and pulse rate was 130. The hæmoglobin was 4.9 gm., leukocyte count 12,000, and peripheral blood smears showed 18% blast cells. The pattern of differentiation was not very clearly defined, but it appeared to be primarily towards lymphocytes. The platelet count was 50,000, and remained low throughout the course of treatment. A bone marrow biopsy taken from the iliac crest showed a marked reduction in erythroid elements and megakaryocytes, and an increased number of blast cells and eosinophils. Although a definitive diagnosis as to type could not be made, it was felt that the effect of cortisone should be investigated.

He was started on cortisone 25 mgm. twice daily on the fifth hospital day, and three days later it was increased to 50 mgm. twice daily. No significant response attributable to the drug was noted. His temperature remained elevated, ranging between 100 and 104° F. during the first week of therapy, and his leukocyte count remained about the same. His eosinophils fell from 33 to zero. Penicillin, 200,000 units daily, was started at this time because of a persistent cough, and his temperature fell promptly to 99° F. During this first week of therapy with cortisone he received two transfusions of 250 ml. each, and his hæmoglobin was increased to 10.5 gm. %. His splenomegaly, hepatomegaly, and lymphadenopathy were not appreciably altered. His leukocyte count rose gradually to 29,500 with 50% blast cells.

The patient was discharged on the 15th hospital day to report back for follow-up studies three times weekly. His condition deteriorated fairly rapidly, and one week after discharge his white blood count had risen to 195,000, 77% of which were blast forms, and his hæmoglobin had fallen again to 5.6 gm.

The differentiation of cases of acute leukæmia into specific types is frequently very difficult and often impossible. We were unable to clearly define these two cases as to type. The result of treatment with cortisone tends to favour a myelogenous origin of the disease in these two undifferentiated leukæmias. These findings, when considered in the light of the experimental evidence on the effect of the hormone on lymphatic tissue, emphasize the fact that a very careful evaluation of cases as to type is extremely important if cortisone is to be used in treatment.

SUMMARY

1. Five cases of acute leukæmia, two acute lymphatic, one acute monocytic, and two acute undifferentiated leukæmia, treated with cortisone are reported.

2. One case of acute lymphatic leukæmia showed a dramatic temporary remission. The other showed no significant change other than a decrease in the amount of lymphatic tissue.

3. One case of acute monocytic (myelogenous) leukæmia was treated with a combination of aminopterin and cortisone. The response was negligible.

4. Two cases of acute undifferentiated leukæmia were treated. The response in these cases was also very poor.

5. A failure of the 17-ketosteroids excretion to rise on large doses of cortisone was observed in one case.

CONCLUSIONS

Cortisone would appear to be of some benefit in some cases of acute lymphatic leukæmia. The remission produced is only a temporary one.

Cortisone would appear to be of little value and perhaps be contraindicated in acute monocytic (myelogenous) leukæmia, and in some cases of undifferentiated leukæmia.

An accurate diagnosis as to the type of leukæmia should be made if at all possible before treatment is instituted.

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THE PLACE OF SPLANCHNICECTOMY IN THE TREATMENT OF HYPERTENSION*

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OUR ideas on the proper selection of patients for splanchnicectomy have changed radically in the past fifteen years of experience with this operation. Between 1935 and 1941 when Dr. Poppen did the Peet operation, resecting the twelfth thoracic through the second lumbar ganglion only, we soon learned to avoid operating on patients with any nephrosclerosis, anyone whose blood pressure would not drop to normal on rest or sodium amytal, anyone with an enlarged heart or poor kidney function. This was because results with the low resection were so poor on such patients. This denied salvage to those patients in most immediate danger and led to the criticism that we were operating on patients with relatively benign hypertension whose life expectancy might be as good without operation as with it.

Gradually we raised our upper level of resection and sought to extend our criteria into Grades III and IV hypertensives, and soon came to abandon the operation for hypertensive patients with Grade I fundi and patients with Grade II fundi who so far had no degenerative cardiovascular or renal disease. Thus, within four years, we have come to apply the operation more and more to patients with a poor prognosis and less and less to patients who may live a normal life span. We must still avoid operating on patients with irreversible changes lest we throw the operation into utter ill repute. The dividing line is a difficult one, indeed, and clinical experience supersedes rules of thumb.

During the course of the last fifteen years Dr. Poppen has gradually raised the height of his resection of the sympathetics to the fourth thoracic sympathetic ganglion. Since 1945 all sympathectomies for hypertension have been of the high dorsolumbar type to the level of the fourth thoracic segment.

In dorsolumbar sympathectomy and splanchnicectomy two large vascular areas are denervated, the parietes of the torso below the fourth thoracic together with the lower extremities, and the splanchnic area. Release of vascular tonus in the splanchnic area has the more potent effect in producing blood pressure fall. Since the sympathetic fibres to the cœliac ganglion are preganglionic, it might be thought that severing the fibres just above the cœliac ganglion would be sufficient, since adding sympathetic denervation of the body wall from the fourth to the twelfth thoracic improves but little the hypotensive effect. Our main reason for going to the fourth thoracic is to slow up and, we hope, prevent regrowth of sympathetic fibres by a lengthy resection and removal of more ganglia. The added technical difficulties of resecting the second and third thoracic make the further extension of the operation hardly worth while.

An amputation neuroma, with evidence of regeneration, was found which had formed at

* Read at General Session of the 81st Annual Meeting, Halifax, June 23, 1950.

the site of the cœliac ganglion amputation four years before in a patient who had a resection to the height of the eighth thoracic ganglion. This patient no longer had a postural hypotensive fall although sweat tests showed there was no regeneration of the somatic sympathetics into the leg. Further resections to the height of the fourth thoracic produced another fall in the orthostatic blood pressure. This has persisted for another two years. These facts offer presumptive evidence at least that synapses had reformed at the cœliac ganglion.

Another compelling reason to adopt such a lengthy resection has been success in obtaining better results. In the first series of 100 cases reported by Poppen and Lemmon[4] in which resections were carried out to various upper levels from the twelfth thoracic to the eighth thoracic, good results in patients with Groups I and II fundi (Keith-Wagener classification[2]) were obtained in 39%; in the second series of 179 cases, all to the fourth thoracic level, reported by Evans and Bartels,[1] good results were found in 74%. In patients with Grade III eye grounds good results from the lower resection were obtained in 21%. They were doubled to 44% in the higher type of operation. Poor results in patients with Groups I and II fundi were cut from 23 to 9.2% and in patients with Group III fundi from 37 to 13.3%. It is true that the first series represents three year follow-ups while the second series represents six months to three year follow-ups, and as Palmer[3] has said, 33% good results in one year are cut to 25% good results in three years. However, we hope that the wider resection of the sympathetic area may prevent the reduction of good results with the passage of years. Not all patients slowly lose their reduction of blood pressure with the passage of years and we have noted, as has Smithwick, performing lower resection, that in several cases in which poor results on the blood pressure were obtained the first year the pressure had fallen to lower levels two or three years later.

However, we no longer regard the operation as a prophylaxis against the further development of hypertension. This attitude has led us to search for more compelling reasons to do the operation than simple elevation of blood pressure. If the resection of the sympathetics could be considered a cure for hypertension in the same sense as resection of the appendix is to be considered a cure for appendicitis, then all hypertensive patients beyond the potential stage should be advised to undergo splanchnicectomy. However, since the operation is a severe one with marked morbidity though low mortality rate (0.5% operative mortality in Dr. Poppen's hands), we are led to ask ourselves first, does this patient need operation? The morbidity is due to the profound orthostatic hypotension produced by this high type of sympathetic resection. It is necessary to equip all our patients with a special girdle with a suprapubic spring pad for pressure and with elastic stockings to help prevent a too precipitous drop of the blood pressure in the standing position. Twenty-six of our patients have required a special modification of the aviator's G suit with inflatable bladders against the thighs, abdomen and calves. This apparatus has enabled patients to return to full time work immediately on donning the suit. The majority of our patients require six months to recover any great degree of comfort in the standing position or enough to return them to a 100% economic status. This fact deters us from offering the operation unless it is needed for beginning degenerative cardiovascular or renal disease. Our attitude now is to offer the operation only to those patients whose longevity is definitely threatened and whose life expectancy may not be more than four to ten years. The increased morbidity of the high operation makes us hesitate to operate on those whose chances of reaching the 60's are good. In our hands, the lower type of operation that could be offered with promise of rehabilitation in three months has not salvaged enough patients with Grade III fundi.

The main effect of the operation is on orthostatic blood pressure. When the blood pressure is taken with the patients lying down 49% of those with Groups I and II fundi still have about as high blood pressure as they did before operation, whereas when it is taken with the patient in the standing position, 69% of them had an excellent or good drop in the blood pressure. In Group III, 69% of patients had little or no drop in their blood pressure in the lying position while in the standing position 48.8% had a good or excellent drop. This fact should be taken into account when the doctor takes a patient's blood pressure after splanchnicectomy in order for him to get a fair idea of what the operation may have done for the patient's hyper-

tension. It is to be remembered that most of the patient's hours lying down are spent in slumber and that the blood pressure is physiologically at its lowest ebb in sleep. The result is that the average blood pressure the clock around is lower than before operation although the doctor may not have obtained this impression checking the blood pressure with the patient lying down or even sitting in his office.

Perhaps more important than the blood pressure figures are the effects of high dorsolumbar sympathectomy and splanchnicectomy on vascular areas. Table I shows the improvement in

TABLE I.
FUNDI

	Group II.	*Group III.*	*Group IV.*
Reverted to I	37	6	2
Reverted to II		29	3
Reverted to III			1
Reverted to normal	11	1	
No change	25	2	
Advanced	0	0	0
Total	73	38	6

the ocular fundi. Hæmorrhagic exudative fundi in Group III show satisfactory reversion to lower groups, 36 out of 44 losing their hæmorrhage and exudate. Five cases out of 8 in Group IV lost their choked discs, hæmorrhage and exudate; 3 patients who were almost blind left the hospital able to read.

The reduction in heart size has been one of the most gratifying results from splanchnicectomy (Table II). Of 31 patients with enlarged

TABLE II.
CHANGE IN HEART SIZE

	Cases
Enlarged before operation	31
Normal size 3 to 6 months after operation	20
Reduced but still enlarged	8
No change	2
Larger	1

Reduction of size in 90%; 64% to normal.

hearts before operation there has been a reduction in the transverse diameter in 90%, 64% reverting to normal size as measured in teleoroentgenograms. This result has led us to believe that an enlarged heart is an indication for splanchnicectomy in patients with Group II or III fundi who still have good kidney function and a labile blood pressure as demonstrated by standard tests.

Forty-two per cent of 50 patients who had abnormal electrocardiograms before operation and who had check-up electrocardiographic examinations after operation showed improved tracings. There was no change in 28 or 46%, and in one case the electrocardiogram showed more damage than previously.

Another satisfactory improvement after high dorsolumbar sympathectomy has been on anginal pain. Because we had 4 deaths from coronary occlusion in patients who had had previous occlusion in an earlier series, we have refrained since from operating on anyone who has had a frank coronary occlusion. However, as Table III shows, relief from anginal pain due

TABLE III.
EFFECT OF SYMPATHECTOMY AT VARIOUS LEVELS ON ANGINA

	T-12 T-5	*T-4*	*T-3 and above**
Total cases	8	15	10
Abolition†	1	9	7
Partial relief	2	2	3
Same	0	1	0
Worse	0	1	0
Died	5	1	0

Summary:

Below T-4 level	12.5%	satisfactory relief of pain			
T-4 level	73.0%	"	"	"	"
Above T-4 level	100.0%	"	"	"	" ‡

*Only one patient had resection through the inferior cervical ganglion on both sides, 3 through the inferior cervical ganglion on one side or the other.

†Abolition of all substernal pain and other sensations except for choky feeling in throat and/or slight pain sensation down arm on exertion.

‡The 10 patients who had resections of the anginal pathway were all severe cases—1 totally bedridden with status anginus. Only partial relief of substernal pain in 3 patients was "satisfactory" to the patient. These 3 patients had left T-2 and right T-3 or 4 resection. We would now take the inferior cervical ganglion on both sides for maximum results.

to coronary insufficiency has been gratifying. In a previous series of resections below the fourth thoracic level 8 patients had anginal pain with relief in 12.5%. In 15 cases of angina in the high dorsolumbar sympathectomy series with resection at the fourth thoracic level, 73% had relief.

Since these figures were computed, we have adopted the policy of resecting the so-called "anginal pathway," first to the fourth thoracic ganglia, in all cases of severe angina with hypertension. We have done 10 of these, all with satisfactory relief of anginal pain. There is often left a warning feeling of constriction in the throat. However, 2 of our 10 patients did not even have this minor discomfort. This small series is being made the subject of a separate report. White and Bland's[5] pioneer work in this field has led us to adopt this method.

Reports in other series of cases have been rather discouraging as regards improvement in

renal function. However, in 36 patients in Group II who had adequate comparative tests before and after operation there was improvement in one or more tests in 21. Eight out of 16 patients with Group III fundi showed improvement in one or more tests. Clinically the patients are often gratified to lose their nocturia following operation.

There was marked relief from symptoms, especially headache, in 78% of patients reporting symptoms in Groups I and II, and in 63% in Group III. However, in Group IV, two-thirds of the patients failed to obtain relief of symptoms or died.

The real answer as to the value of any type of splanchnicectomy for hypertension will be a comparison of the survival rates of hypertensive patients, be they treated medically or not at all. Palmer has set up such criteria to meet. Since the prognosis is so good in Group I and since the operation cannot be regarded as curative and since our type of operation produces so much morbidity, we do not feel justified in operating on patients with Grade I hypertension. The answer to our question "Does this patient need operation?" is no.

In the hypertensive patient with Grade II fundi the prognosis is still so good, especially in women over 45 years of age, that we no longer advise the operation in these cases unless the answer to our question "Does this patient need operation?" is yes. We believe the answer is yes when the heart is enlarged, when there is a pattern of left ventricular strain in the electrocardiogram, when they have had symptoms of left ventricular failure (nocturnal dyspnœa), without frank rightsided decompensation or when there is slight renal impairment which we estimated as not being irreversible. This means that the non-protein nitrogen is normal or can be brought down to normal and that the intravenous pyelogram shows good excretion of the dye. We also operate on patients with Grade II hypertensive retinopathy if they have had mild cerebral vascular accidents that we try to judge are not due to arteriosclerotic thrombi or emboli. It is our belief that many so-called cerebral vascular spasms are due to small globule hæmorrhages, probably venous in origin, or perivenous exudates occurring in the cerebral vascular bed, the same as can be actually seen in the retinal vascular bed. Since the retinal vascular bed improves so markedly after splanchnicectomy we hope for the same improvement in the cerebral vascular bed. We appreciate the difficulty of judging whether or not cerebral vascular accidents have been due to thrombi in atheromatous cerebral arteries.

A necessity in the selection of cases in Group II as already stated is that the patient must still have a labile blood pressure, no advanced atheromatous arteriosclerosis, and fair renal function.

However, the real test of the worth of this high dorsolumbar splanchnicectomy lies in the group of patients with Grade III fundi who so definitely need salvaging because the four-year survival rate is 68% according to Palmer and only 33% according to Keith and Wagener.

Disparity in the survival rates must be due to criteria in selecting cases as belonging to Group III. Our selection of patients has been strictly according to eye grounds corresponding most closely to Keith-Wagener's criteria; that is, they all had hæmorrhage or exudate in the ocular fundi. Twenty-four patients had high dorsolumbar sympathectomy more than three years ago for Grade III hypertension. Of these 24 there are 19 survivors; at the end of four years there are 6 survivors out of 8 patients. Keith's and Palmer's survival rates do not approach each other until the end of six years and we shall have to wait this length of time before we have a fair appraisal of the ability of high dorsolumbar splanchnicectomy to salvage a large enough group of patients with Grade III hypertension. Meanwhile life has been made more livable for them and in many cases the vision is preserved.

A mere choking of the discs (Grade IV fundi) does not deter us from operating if kidney function is good and the blood pressure still labile.

We are loath to consider this type of operation with its prolonged uncomfortable convalescence as a prophylactic operation for relatively benign hypertension, but urge it on patients under 50 years of age with spastic exudative and hæmorrhagic retinal arteriolar changes, moderate cardiac damage, signs of early nephrosclerosis and labile blood pressure.

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ULTRAVIOLET SPECTROPHOTOMETRIC STUDIES ON THE CEREBROSPINAL FLUID IN NORMAL AND PSYCHOTIC INDIVIDUALS*

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IN the course of a long-term project concerned with the eventual detection of biochemical abnormalities in the intermediary metabolism of psychotic patients, we decided to turn our attention to the chemical composition of the cerebrospinal fluid (CSF) which, we think, might reflect the chemical changes occurring in the central nervous system. The report of Hydén and Hartelius[1] on the nucleoprotein depletion of the frontal cortex in schizophrenia and the known strong absorption of purine and pyrimidine compounds in the ultraviolet portion of the spectrum[2, 3] prompted us to investigate the ultraviolet absorption spectrum of CSF.

CSF samples, obtained by lumbar puncture, were analyzed in a model DU Beckman spectrophotometer after having been adjusted to constant pH by the addition of 0.25 ml. pH 7.00 buffer solution to each 3.0 ml. CSF. The blank consisted of 3.0 ml. distilled water to which was also added 0.25 ml. of buffer solution. In all measurements, slit width was fixed at 0.54 mm. and the cell depth of the blank was 1.004 cm. as compared to 0.998 cm. for the unknown. Appropriate correction for the unknown readings, based upon previous calibration, was effected in each case. No attempt was made to correct for the dilution brought about by the addition of the buffer solution.

The mean absorption curves of 34 schizophrenics and of 17 normal people, indifferently male or female, are shown in Fig. 1. The peak of the curve for schizophrenics (circles) lies around 269-270 mμ while that of normals (black dots) is in the region of 276 mμ. As it is well known that proteins absorb in the same region, the protein content of CSF was determined according to the usual sulfosalicylic acid turbidimetric method and the results converted to absorbancy readings as follows: diluted samples of pooled human serum, corresponding respectively to 35 and 70 mgm. % protein concentration, were analyzed for their absorbancy in the wavelength region 240-320 mμ, after having been adjusted to pH 7.00 as previously described. From the absorption spectra so obtained, absorbancy correction factors for protein content were computed for any wavelength between 240 and 320 mμ, assuming first, a practically identical distribution of amino-acids in serum and CSF proteins, and second, that no interfering substances could exert their effect in 200- and 100-fold dilutions

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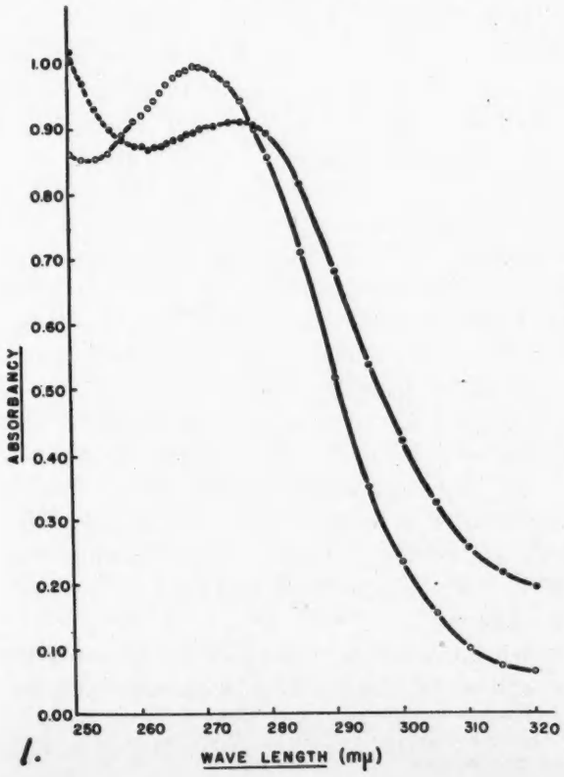

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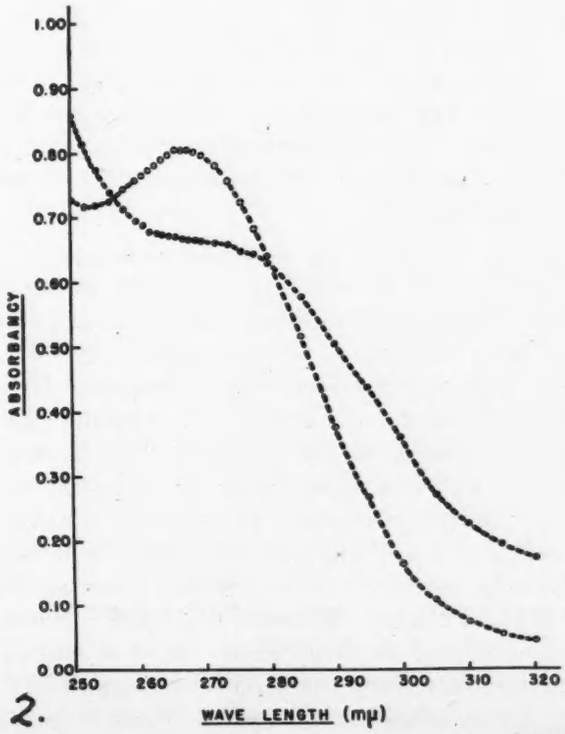

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of serum. The absorbancy corresponding to protein content was subtracted from the readings and corrected absorption curves were obtained. They are shown in Fig. 2.

Even a superficial examination reveals a definite difference between the two curves. Whilst the absorbancy of normal CSF (black dots) decreases continuously, if not regularly, as the wavelength increases, the absorbancy of schizophrenics' CSF shows a peak at 268 mμ. At this particular wavelength the mean absorbancy for the schizophrenic group is 0.799 with a probable error of the mean of ± 0.040, while it is 0.668 ± 0.023 in the case of normal CSF. The difference between the two means is statistically highly significant, the t value (calculated according to Fisher) being 4.97. The comparison of the difference between the 268 and 252 mμ readings in both groups gives a t value of 27.6 for the uncorrected curves (Fig. 1) and of 62.4 for the corrected ones (Fig. 2).

Before attempting to discuss these results, one must bear in mind that one is dealing with a complex solution, the absorbancy of which, at a given wavelength, is the sum total of individual absorbancies for each separate compound present in the sample. In order to determine if the observed peak corresponds to nucleoprotein material, we undertook a series of determinations of nucleoside and nucleotide content of CSF in schizophrenics and in normal individuals. Although we have not accumulated enough results to warrant a definite conclusion, we have consistently found the nucleoside and nucleotide content of schizophrenics to be higher than normal. Detailed findings will be published later.

It may be added that we had no knowledge whatsoever of the mental state of the patients when the spectral curves were determined. Yet, in every instance, a schizophrenic's CSF was readily recognized from the obtained data. Furthermore, in one test experiment, the psychiatrist compared the severity of the disease in two schizophrenics differing markedly in their absorption curves. It happened that the severity of the disease was correlated with the difference between the corrected absorbancies at 268 and 252 mμ. However, "normal" curves were obtained in three cases where a routine diagnosis of schizophrenia had been established. We are working on this aspect of the problem before investigating the possible diagnostic value of our findings.

When this part of the work was nearing completion, our attention was drawn to an earlier report by Spiegel-Adolf and co-workers[4] stating that the CSF of schizophrenics shows a definite absorption band at 265 mμ (uncorrected for protein concentration) and that it contains appreciable amounts of nucleoprotein-splitting enzymes. Our results seem to agree quite well with those of Spiegel-Adolf, although our peak is at 268 mμ instead of at 265 mμ.

We wish to thank Drs. Hermas Tellier and Gaston Loignon, who helped in the clinical aspects of this investigation; Mr. Hector Dansereau of the Provincial Laboratory of Health, for samples of normal CSF; and Miss Denise Plante, for skillful technical assistance.

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PUBLIC HEALTH AND MEDICAL CARE IN NEWFOUNDLAND*

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THE wording of the title of this paper should really be reversed, as it is in the medical care aspects of our program rather than in the preventive aspects that we have something a little different to discuss. I should like to make it quite clear at this early stage that there is no intention of suggesting that the present plan of medical care in Newfoundland is ideal. It is in direct contradiction to the expressed principles of the Canadian Medical Association with regard to health insurance. Rather it is my wish to describe briefly a system that is working, to try to answer any questions that may be asked about it and to pay close attention to any suggestions for an alternative arrangement that will provide at least as good a service at reasonable cost and at the same time will follow the principles and the tenets of this Association.

During the last decade or so, in following the reports of discussions concerning the develop-

* Read before the Section of Medicine at the Annual Meeting, Halifax, June 22, 1950.

ment of the various types of health insurance in Canada and in other countries, I have often felt that the Newfoundland experience should be better known in medical circles. In my opinion, we have the nucleus of an eminently satisfactory type of health and hospital insurance for limited population groups. For fifteen years, the former Department of Public Health and Welfare, and more recently the Department of Health has been administering a prepayment scheme for medical and hospital care which now covers over one-third of the population of Newfoundland. Before presenting the details of this scheme, it will be necessary to say something of the medical and other aspects of the local situation on which the system was imposed. (It is then intended to show how it has been utilized to further our preventive medical program, which can still be considered to be somewhat underdeveloped along certain lines.)

The number of medical practitioners in Newfoundland has always been low on a "physician per population" basis. In many places today there are upwards of 4,000 and in some places as many as 8,000 of population per practising physician. It should also be remembered that our average population density is less than nine people per square mile and that our population of 345,000 has not the same ready access to rapid means of communication and transportation as is commonly the case in the other provinces of Canada. There are only thirty-five communities with populations of over 1,000 and even in these there is much less than the ordinary tendency towards local government organization.

Up to the present Newfoundland has not been able to produce and hold from its native sons, a sufficient number of doctors to look after the needs of the population. Through the years we have welcomed medical graduates from the mainland of Canada and from England, Scotland and Ireland. Today, our medical register shows a high percentage of graduates from across the seas including local men, and others who have made our province their permanent home. On a population basis, Newfoundlanders are still unable to gain admission to Canadian medical schools in the same proportion as are the residents of other provinces. It must be said and with all due modesty, that this is not on the basis of lack of scholastic attainment.

PREPAYMENT CARE

As early as in the year 1860, doctors practising in Newfoundland had introduced the so-called "book system" under which ordinary medical care was prepaid at the rate of $2.50 per family per year. This amount was paid direct from the patient to the doctor at a stated time every year. There was in some places the gradual establishment of medical committees who served as a liaison between the doctor and the people. Certain rules and regulations were sometimes accepted by doctor and patients. There was some variation as to what was to be included under the care to be furnished for this flat annual fee. By the early thirties of this century, the fee had been increased to an average of $6.00 per year. The system is still in existence in some districts with the fee increased to $10.00 per year. This system applied, of course, only to rural areas. In the larger centres of population medical practice has usually been on the basis of fee for service. In St. John's, a domiciliary service for those unable to pay has been carried on by full time medical officers of the Provincial Health Department.

It should be recollected, too, that Government had in Newfoundland been paying retainers to medical men for medical care to those who could not afford to pay for themselves. In most cases this was on the basis of a flat annual grant and not on fee for service basis.

Before Government schemes were inaugurated, the idea of prepayment had also been carried on under voluntary organizations in certain restricted areas of the country. However, in these it was usually the rule that the prepayment entitled those concerned to services at reduced rates rather than at no additional cost.

It was with this background of shortage of medical personnel, of existing prepayment plans in medical practice, of modified schemes under the auspices of voluntary organizations and in the darkest days of the depression of the 'thirties that the Government inaugurated a system of Cottage Hospital and Nursing Stations which were to be the key-stones of a system of prepayment health and hospital insurance. Serving approximately 115,000 people there are 30 doctors, varying numbers of nurses, with 350 beds in 14 hospitals. Of these hospitals, 12 were built by the Government as Cottage Hospitals and two were ob-

tained by partial utilization of military buildings erected as hospitals for the armed forces during the last war.

For an annual payment of $10.00 per family, the people concerned are entitled to medical care both as outpatients and in hospital as well as domiciliary visits. The payment does not include transportation costs, maternity care, dental extractions or drugs. It should be noted here that because of the shortage of dentists, dental extractions have been included in the duties of all rural practitioners whether or not they practise under this prepayment plan. The annual fee has been increased threefold since the inauguration of the scheme but it will be, of course, realized that even at its present level, it is possible only because the net costs are borne by Government. The amount of the annual fee has been based on the amount paid by families under the "book system" of medical practice.

The Cottage Hospital District consists of one or more medical practices and nursing districts depending on population, communication and transportation. The nucleus of the District is the Cottage Hospital and the immediately surrounding medical practice. The doctor in charge of the Cottage Hospital is responsible for all the work in his own medical practice as well as the hospital care of patients referred from the other doctors and nurses in his hospital district. The doctors in charge of the outlying medical practices have responsibility only for the medical care of the families in their immediate districts. The cottage hospital doctor receives a basic retainer plus two-thirds of the annual fees collected from subscribers in his medical practice. In almost all cases he has a rent-free comfortable house and needs to make practically no financial outlay in the conduct of his practice. In a district where roads are available the doctor provides his own car and usually does not break even on transportation.

The typical Cottage Hospital District today has as its focal point a hospital of say, 24 beds, one doctor, two or three graduate nurses, four ward aides, a laboratory x-ray technician, domestic staff, janitor-orderly, and secretary. A moderately well equipped operating room and modern x-ray apparatus are available.

The doctor is expected to perform minor surgery and such major operations as routine appendectomies and herniotomies and more difficult procedures in emergencies. In actual practice, a wide variety of surgical procedures have been carried out by Cottage Hospital medical officers. There are usually large outpatient clinics and in some cases the doctor must also do considerable travelling under varying conditions.

He can refer his subscribers to the Provincial General Hospital in St. John's for diagnosis and treatment. The benefits cover ward care in that institution as well as the costs of medical and surgical care. The Department of Health pays the staff for work done on these cases on an agreed reduced scale. The patient is not entitled to transportation to St. John's nor is he entitled to decide on his own that he needs to leave his own district. He must be referred by his local physician except, of course, in cases of emergency such as if stricken with an acute condition while away from home. The patient does not have choice of doctor either at home or if referred to St. John's. In his own district, no choice is available anyway and in the St. John's Hospital his only alternative is to pay his entire costs for semi-private or private accommodation as well as professional fees if he desires to pick a doctor other than those in charge of the ward service to which he has been automatically referred.

The scheme of prepayment is compulsory in that families who have not paid within the first three months of the hospital year, or who have not made suitable arrangements to pay, must pay a penalty fee of double the annual fee as well as the costs of the illness for which they seek attention.

The doctor's percentage is taken from the gross receipts in annual fees in his practice the remaining one-third going towards the over-all cost of the scheme. The doctor is not a civil servant and is not pensionable. While he cannot charge fees to subscribers except as specified for maternity and dental work, he is at liberty to charge ordinary fees for services to transients, Workmen's Compensation cases, and for work done for the Department of Veteran's Affairs, life assurance examinations, etc. The amount of such additional work varies from very little in some districts to a considerable amount in others.

Some of the criticisms levelled at the scheme have been that subscribers receive too much for too little, that there should be an income barrier

for subscribers at the low rate, and that the prestige of the doctors has been lowered. On the other hand, advantages have been mentioned as including better remuneration for the doctors, better working conditions, better living conditions, and the absence of worry about bills. It is natural that there have been apparently valid arguments advanced to contradict both the criticisms and advantages quoted. It is a fact that since the difficulties of the war years, there has been no trouble in keeping the medical posts filled.

In our dream for the future we visualize larger staffs, trained public health nurses, and in some instances, we think it possible that around the Cottage Hospital Districts, there might be built up a decentralized branch of the Health Department.

My brothers in Public Health may consider it to be rank heresy, when I say that I am by no means convinced that it is possible, desirable, or necessary to utilize full-time health officers in sections where adequate medical care is not yet fully available. We have, on the other hand, done our best to interest the practising physician in the preventive technique, and we have leavened our persuasion by the benefits of moderate financial rewards. Every doctor in the rural areas of Newfoundland can take part in—and must do—such work as diphtheria toxoiding, V.D. treatments and contact follow-up, tuberculosis control. Pneumothorax refills are done by those who have the facilities at hand. Some conduct well-baby and antenatal clinics. The immediate investigation of the now more rarely occurring outbreaks of typhoid fever and diphtheria is usually carried out by medical practitioners at the request of the Health Department. Scientifically and statistically, it is true that we do not get the story of these outbreaks as completely as we should like, but the more important angle of early and effective control is accomplished.

I have tried to tell you something of certain aspects of medical practice in the rural sections of the newest part of Canada. We have had and will probably still have our troubles, but I feel that our experience should be of some value in future planning that is undoubtedly necessary for medical care in our country.

Our aim has been to provide a medical and hospital service for people who were finding it increasingly difficult to provide even medical care for themselves. By means of a prepayment plan operated and subsidized by Government it has been possible to bring many of the aspects of modern medicine to people in remote areas and at the same time offer certain attractions to the medical practitioners.

Those of us who have been concerned with the administration of the scheme which, in many of its effects, is not too well disguised state medicine, listen with some anxiety to the alternative suggestions about which we read and hear. Certainly we can perceive no advantage in throwing overboard the experience gained in our Health Department and in asking a so-called independent commission to start anew, unless that commission could be charged with the administration of all health services.

I suggest to you that the problems to be faced in the provision of medical care, should not be allowed seriously to interfere with the common desire in the minds of doctors, whether they be practising physicians or representatives of organized medicine or government officials, to prevent and to heal the ills of mankind.

DIVERTICULA OF SMALL BOWEL AND THEIR SURGICAL SIGNIFICANCE

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THE discussion in this paper is limited to diverticula of the small intestine, excluding those found in the duodenum and congenital Meckel's diverticula. The former are fairly common and often seen by x-ray. They are commonly symptomless and difficult to treat surgically when present in the third and fourth portions of the duodenum. Meckel's diverticula are very common and only occasionally present surgical problems. Diverticula in the large bowel are extremely common and are not considered in this paper.

Incidence.—There have been few attempts to summarize the recorded treatment of jejunal diverticula. One of the first reviews was made by Rankin and Martin in December, 1934. They stated that in routine gastro-intestinal series about one case in 25,000 examinations was discovered. In 1946 Ritvo and Vota estimated that about 300 cases were recorded in the literature. These included those found at

autopsy, operation, or by x-ray, the greatest number being found in the latter group. Prior to 1924 only 66 proved cases could be found after searching the literature.

Edward of King's College Hospital, London, in an admirable treatise in 1939 reported on 16 cases. These had occurred during a period of 12 years and had been thoroughly examined pathologically. He stated that 9 cases of jejunal diverticula were found in 2,028 autopsies: an incidence of 0.31%. He quoted another series in which 16 cases were found in a series of 13,000 autopsies, or an incidence of 0.12%. In his hospital only 7 cases were found in 11,362 routine barium meal examinations, which is an incidence of 0.06%.

Pathology.—Most jejunal diverticula are found on the mesenteric border. Only unusually does a case present itself on the antimesenteric side. This is traced to an ectopic site of entrance of the terminal blood vessels to the bowel. The diverticula are usually multiple and vary greatly in size and number. Sometimes they occupy the full length of the small intestine. They may be thickly congregated or may be very sparsely situated. Occasionally their presence is restricted to a short segment.

Edwards showed that they occurred because of the blood vessel anatomy in the small intestine. Normally, the terminal arteries coming from the arches or arcades, run straight into and through the small intestinal muscle wall. This leaves a potential weak spot. Finally normal peristaltic action assisted by pulsion from within produces a herniation of mucosa, which is a precursor of a diverticulum. This has only to increase in size to become visible in x-ray or at operation. Usually the wall of the sac contains little or no muscle components, but only mucosa and serosa.

For many years these cases were only encountered in an acute abdominal emergency of perforation, inflammation or obstruction. The sequence of events leading to these emergencies followed the course of any other similar intestinal pouch. First, there would be stagnation of intestinal contents. This was followed by acute or chronic inflammation. Adhesions occurred at times and in their wake obstruction. Perforation and hæmorrhage were occasionally seen; these sacs have also been the seat of new growths.

Diagnosis.—In acute emergencies caused by late complications of diverticula, the usual symptoms and signs of abdominal emergency are present, such as hæmorrhage from the bowel, small bowel obstruction, perforation of a viscus, or acute inflammation in some portion of the abdomen. These cases are mainly diagnosed at operation. However in chronic cases usually no symptoms are present except flatulence, a heavy oppressive feeling in the abdomen or some unexplained discomfort. At times other accompanying pathological conditions are present and receive medical or surgical attention. Then, it is only after careful small bowel studies are made roentgenologically that diverticula are discovered. Useless surgery or the labelling of patients as neurotics may result from not looking for diverticula in obscure abdominal disease.

Treatment.—Acute emergencies deserve only essential treatment. Hæmorrhage should be controlled in the most logical method; obstruction should be relieved; perforation should be closed as in a peptic ulcer. Where an inflammatory mass is side-tracked almost every case eventually comes to resection for relief of obstruction.

However it is the chronic cases which seem to cause more controversy as regards treatment. Edwards again states that posture and diet have absolutely no influence on relieving symptoms. He indicts intestinal antiseptics, laxatives or purgatives. In his opinion, if the diverticula are large or show prolonged x-ray retention, and, where only a short segment of bowel is involved, operation is indicated. He categorically stated that no other operation should be done except resection. Whether or not a lateral or an end-to-end anastomosis were performed, was immaterial.

One very important consideration comes up, and that is how much small bowel can be resected in an attempt to do a radical cure, without imperilling the digestive function of the small intestine. It would seem that an average of five feet or slightly more should be the upper limit of surgery. More than that would be likely to cause some definite impairment.

The following case is being reported to illustrate some of the points of this discussion. It is a case of multiple diverticula occurring in a relatively restricted segment of jejunum comprising large and small pouches, some of which do not empty readily. Fortunately the segment was far enough away from the ligament of Treitz to make for ideal surgical cure.

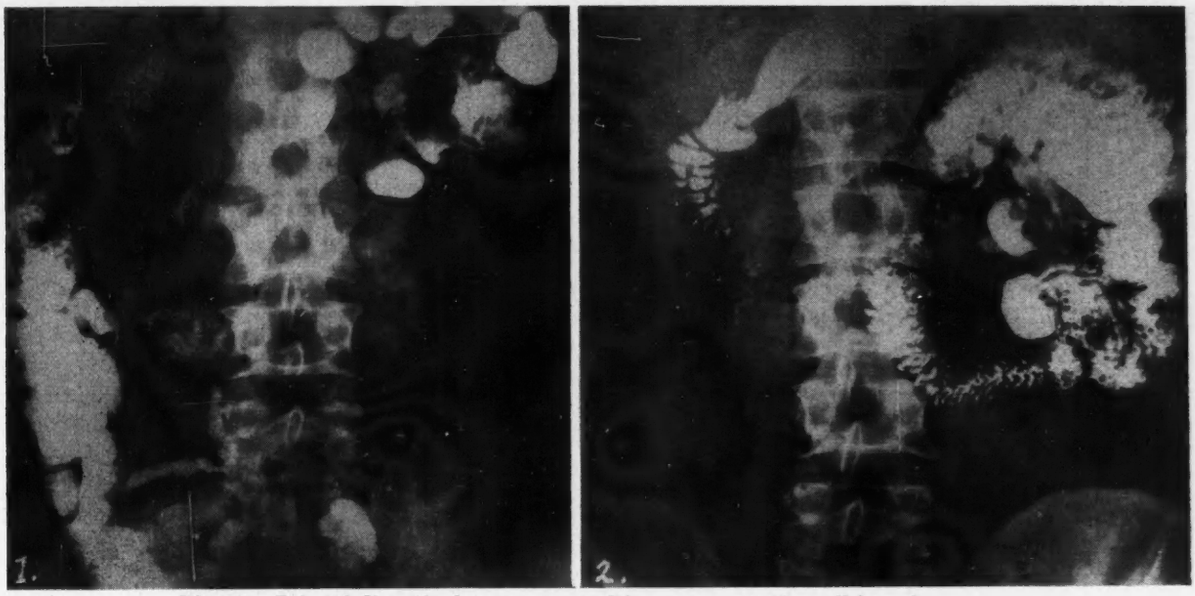

Fig. 1.—Jejunal diverticula seen grouped in a segment of small bowel.
Fig. 2.—Diverticula seen in relation to stomach, duodenum and splenic flexure.

CASE HISTORY

The patient was first seen on January 15, 1948. He was a plant executive, aged 48 years. At that time he stated that he was having discomfort in his epigastrium about half to one hour after meals which was somewhat relieved by taking food and alkalies. He had been x-rayed elsewhere 1½ years previously and an active duodenal ulcer was found. His treatment had been fairly sound up until this time, but he had not been entirely able to relieve his symptoms by diet and medicine. On January 20, he was x-rayed here and an active duodenal ulcer again diagnosed. The patient agreed to go on a very strict regimen and was given three months' treatment by diet, antispasmodics and rest. Following this an x-ray by our radiologist showed disappearance of the ulcer.

After the disappearance of the ulcer the patient carried on with a fairly strict regimen as regards smoking and drinking, diet, rest and occasionally antispasmodics. An x-ray was again taken on February 3, 1949. At this time there was no evidence of recurrence of the duodenal ulcer previously reported. The patient, though not feeling perfectly well, was satisfied that he was probably feeling as well as he ever would.

However on January 16, 1950, he stated that he was getting dissatisfied. There were occasional days when he felt well but this would only last for 2 to 3 days. If he walked far he had epigastric pain. He had almost constant soreness in the abdomen which was described as a discomfort. What food he ate did not seem to make much difference. He felt well usually after a meal but the trouble started some time afterwards. The pain began late in the morning and lunch did not relieve it. There was also soreness in the lower abdomen, a sort of draggy feeling, when he was suffering from the worst part of the pain in the stomach. On certain days the abdomen was sore all over. He had no constipation but he did have occasional sour eructations with heartburn and gas. Originally, the patient had asked for a vagotomy as he had heard that they were very beneficial in ulcer cases. This was refused him. This time he wanted to know if a gastrectomy would not help him as he was confident that medical treatment would not cure him.

Following this consultation, at which physical examination was negative except for some tenderness to the left of the umbilicus and slightly above, a gall bladder x-ray was taken and proved to be negative and the gastro-intestinal series was repeated. Our radiologist, Dr. D. C. MacNeill, stated in summary, "A negative gall bladder. There is no sign of activity of the ulcer in the duodenum or any abnormality in the stomach except for spasm. There is possible abnormality in the small bowel."

Because the patient's ulcer had been persistently healed in all x-ray examinations and because of abnormal small bowel shadows found in the routine gastro-intestinal examination, Dr. MacNeill suggested a complete small bowel study. When this was done it was quite evident that the patient had several large pouches showing fluid levels and barium retention. The largest measured about 2" in diameter. Study of the film also revealed the fact that there were smaller pouches farther along the bowel and that the whole affected segment probably did not measure more than 2 to 3' in length. Fortunately also, the pouches did not begin for several inches past the ligament of Treitz.

After consultation and after reviewing the literature, it was decided that he was an ideal case for complete cure by resection. Accordingly February 16 he was operated on through a left rectus incision. The stomach was examined and showed a moderate scarring at the pylorus and an apparently normal gall bladder. The diverticula were found as expected, the largest lying about 10" from the ligament of Treitz; it was also first in the series. There were a few fairly large ones in the next two feet and a few smaller ones in the last few inches of the affected portion. In all, about 30" of jejunum were marked out for resection. Near the large diverticulum in the adjacent mesentery, there were calcareous deposits in the lymph glands. This was removed with the affected portion of intestine, after which, because of the discrepancy in size of the proximal and distal lumina, a side-to-side anastomosis was performed. The mesentery was treated by folding and suturing to prevent pocketing.

Blood supply to the bowel appeared to be good at the close of the anastomosis. The abdominal wall was closed in the usual manner except that retention sutures were placed including the anterior sheath. Gastric suction was discontinued on the third day after a bowel movement with an enema had been successfully achieved. The patient was out of bed on the second day and was walking about within five days. He was discharged on the eleventh day postoperatively in good condition. Subsequently he had nothing of interest and when seen 2 months after operation he reported that he had not felt as well for years. He was having little or no digestive trouble and had been entirely relieved of the previous severe abdominal discomfort.

SUMMARY

1. A review of jejunal diverticula has been presented.

2. Pathology, symptomatology and treatment of acute and chronic cases have been described.

3. Importance of x-ray diagnosis has been stressed. Obscure abdominal pain should suggest the possibility of this diagnosis.

4. A case has been discussed which was ideal for surgical cure and which exhibits some of the difficulties in diagnosis and medical treatment.

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THE EARLY SYMPTOMS OF TETANUS WITH A REVIEW OF 22 CASES

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TETANUS is now becoming a relatively rare disease. The average internist or surgeon sees it so infrequently that awareness of its possibility is diminished. Therefore, there is sometimes a delay in the diagnosis and thus in the institution of treatment when tetanus does occur. For this reason it was felt that it would be worth while to review the cases of tetanus that had occurred at the Royal Victoria Hospital from 1916 to 1949. In so doing, the earliest presenting symptoms could be determined with regard to their relative frequency and importance.

During the period from 1916 to 1949 (33 years) 22 cases of generalized tetanus have occurred and have been studied in detail at the Royal Victoria Hospital. The age of these patients ranged from 17 days to 71 years. There were 3 female patients and 19 male patients. No case of local tetanus was recorded.

In 9 cases the incubation period could be accurately calculated from dates of injuries to onset of symptoms. It ranged from 6 to 30 days. The incubation period showed an arithmetic average of 14 days.

It was extremely interesting to calculate the number of times certain symptoms were encountered when tetanus was recognized by the examining physician. The most frequent symptom noted at the time of diagnosis was stiffness of the neck or upper back. This symptom occurred in 15 of the 22 patients. In many of these patients it occurred before there were any symptoms referable to the jaw. Stiffness of the neck was accompanied by pain in the neck in 7 patients and was not accompanied by pain in 8 of the 15 patients. The next most frequently encountered symptom was "lockjaw". Eleven of the 22 patients, or 50%, complained of stiffness, tightness or spasm about the mouth or jaws which made it difficult for them to eat, swallow or sometimes to talk. In some of these patients it was noted that the patient could open his mouth well if he did so very slowly. If he attempted to open his mouth quickly, the spasm in the temporal and masseter muscles became apparent and the jaw clamped shut immediately.

Stiffness of the arms or legs was a presenting complaint in 6 of the 22 patients. The chief complaint in 3 patients was "stiffness of the shoulders". Three patients who were admitted to the hospital because of open wounds did not have any complaints referable to the tetanus and tetanus developed while they were in the hospital. Three other patients presented the chief complaint of difficulty in speaking, 2 of choking or difficulty in breathing, and 2 of difficulty in swallowing.

Three patients had severe abdominal pain which was caused by violent spasms of the musculature of the anterior abdominal wall.

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Between the spasms the tone of the abdominal musculature was increased, but approached normal. During the spasm, the abdominal wall became very rigid. Four patients were admitted because of "convulsions". These "convulsions" were attacks of opisthotonos. One patient was admitted to the hospital with the chief complaint of acute intermittent chest pain. This pain was retrosternal and presented a difficult differential diagnosis. Only one patient had spasms that were set off by noise or by touching the patient. It is a well-known characteristic of the disease that the spasms are frequently precipitated by loud noise or by other stimulation of the patient.

Thus one may see that the presenting complaint of tetanus may not be "lockjaw". The complaints may be stiffness and pain. When a patient complains of multiple aches and pains, it is sometimes a difficult problem to establish an accurate diagnosis. One patient was seen by a capable psychiatrist because of multiple complaints shortly after admission. The psychiatrist made a diagnosis of functional pain. The later course of events disproved that diagnosis.

The youngest patient in the group of 22 was an infant 17 days old who had an infection of the umbilicus. On admission, the child had vomiting, diarrhœa, cyanosis and a "pinched" appearance of the face, or *risus sardonicus*. Because of the appearance of the face, the diagnosis was made immediately.

The variety of identifiable lesions which had been the breeding place of the *Clostridium tetani* was striking and interesting. These lesions were as follows: partially removed splinters in fingers, 2 cases; rusty nails in feet, 2 cases; accidental shotgun wound, 2 cases; infected fingers as the result of a tear in the skin from a harness chain when a horse lurched, 1 case; an appendectomy wound, 1 case (this case occurred in 1922; the patient's teeth were extracted when he first complained of stiffness and pain in the jaw; he was cured of the tetanus, however); a hook driven into a toe, 1 case; hand crushed in metal rollers, 1 case; a knife cut on the fingers, 1 case; crushed ring finger by a falling pipe (compound fracture), 1 case; extensive burns of buttocks, genitalia and hands (tannic acid was used on the burns), 1 case; frostbite of toes one month previous to onset of symptoms, 1 case; infection at site of self-injection in a heroin addict, 1 case; uncomplicated puerperal sepsis, 1 case; retained placenta removed by physician's hand with resulting puerperal infection (1922), 1 case; wound of foot by horse stepping on it while the patient was standing barefoot in manure pile, 1 case; amputation of little finger in buzz saw, 1 case; postoperative wound infection following arthrodesis of knee for tuberculosis (*Cl. tetani* was later cultured from the plaster of Paris), 1 case. One patient in 1921 had been struck in the abdomen by a flying axe which had become caught in the flywheel of a gasoline engine; the intestine had been perforated and peritonitis and tetanus resulted.

Seventeen of the 22 patients died, giving a mortality of 77%. This mortality figure has no meaning in the light of present-day treatment. The means of preventing secondary infection have improved tremendously since the widespread use of antibiotics. *Cl. tetani* is sensitive to penicillin. Also the use of antibiotics has prevented infection from other organisms and thus prevented the formation of necrotic areas which are necessary for the growth of *Cl. tetani*. Once a case of tetanus has occurred and has been diagnosed, the chance for survival is better now than it has ever been before. Early diagnosis is essential, however. Modern means of treatment are worthless without early diagnosis.

We realize today the necessity of giving large amounts of tetanus antitoxin intravenously and more intramuscularly as soon as tetanus is diagnosed. Today, 200,000 American units is generally considered an adequate dose of tetanus antitoxin. Previously, smaller doses were given daily. Some physicians consider that the initial dose of 200,000 units given at the time diagnosis is made is sufficient. Others believe that this large initial dose should be supplemented after one or two days in early or acute cases. Before the tetanus antitoxin is given, the patient must be tested for sensitivity to horse serum. If the patient is hypersensitive to horse serum, tetanus antitoxin prepared in bovine serum may be administered or the patient can be desensitized to horse serum.

Penicillin should be given in these cases not only because it is effective in limiting the growth of *Cl. tetani*, but also to help prevent pulmonary infection during the course of the disease.

Enormous amounts of sedatives are required by the patient with tetanus. Barbiturates, paraldehyde, chloral and avertin probably are preferable to use in these cases. Magnesium sulphate, given intramuscularly, is of value; its intravenous use is often dangerous. The sedative used must sometimes be changed because a high degree of tolerance for any particular drug may soon develop in a patient with tetanus. The use of curare-like drugs is advocated by some writers for severe cases of tetanus in order to block the muscle spasm at the myoneural junction. At present it is thought that curare is safe in the hands of those trained and accustomed to its use. In inexperienced hands an overdose of the drug may easily cause death. Artificial means to support the patient's respirations should be present at the bedside whenever curare is used.

General means of supportive therapy including oxygen, intravenous fluids and Levin tube for feedings are necessary. The continuous presence of a nurse to suction mucus from respiratory passages is of great importance in the care of patients with tetanus. These procedures are generally understood and do not require further discussion.

Because of the frequent respiratory embarrassment which occurs in these patients and because of the excessive accumulation of secretions in the trachea and bronchi, it has recently been advocated that tracheotomy should be carried out as soon as any respiratory difficulty is encountered.

Because of the occurrence of compression fractures of the vertebræ due to the violent contractions of paravertebral muscles in generalized tetanus, any patient who has been cured should have roentgenograms of his spine before he is allowed to be ambulatory. These fractures are usually not shearing in nature, and thus are not likely to cause spinal cord compression.

A properly integrated tuberculosis control program has been defined by the World Health Organization as consisting of the following five elements, no one of which is effective alone: (1) prevention; (2) case finding; (3) isolation and medical care; (4) rehabilitation and after care; and (5) social and economic protection of the afflicted family.—L. H. Garland, *Irish J. Med. Sc.*, p. 489, November, 1950.

ACUTE ABDOMINAL PAIN
(Critical Analysis of 200 Patients)

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THIS discussion concerns a brief analysis of the diagnostic and therapeutic mistakes which occurred in 200 consecutive patients complaining of severe abdominal pain. The chief factors are set forth in nine charts and commented upon separately.

CHART I.
LIST OF ORIGINAL DIAGNOSES

Abscess		7
Appendix	3	
Pelvis	2	
Sub-diaph.	2	
Appendix		16
Allergy		1
Anæmia—pernicious		1
Acidosis—diabetic		1
Arthritis—spinal		2
Buerger's disease of mes. vessels		1
Biliary tract		35
Coronary thrombosis		3
Colitis—acute ulcerative		4
Cæcum carcinoma		1
Colon obstruction		6
Carcinoma	4	
Fæcal imp.	2	
Diverticulitis sigmoid		4
Duodenal obstruction (Cause?)		1
Drug addiction		1
Embolus to mes. vessels		2
Embolus to spleen		1
Endometriosis		3
Genitourinary tract		14
Calculus	8	
Stricture	2	
Aberrant vessel	1	
Prostate	1	
Epididymitis	2	
Hepatitis acute		2
Hernia		4
Incarcerated	2	
Strangulated	2	
Jejunum—ileum		15
Obstruction	10	
Inflammation	5	
Psychoneurosis (Acute G.I. localization)		14
Neuritis		5
Post herpetic	2	
Abd. wall (no arthritis)	3	
Ovary strangulated		3
Pulmonary disease		5
Pancreas—acute œdema		1
Pregnancy		2
Tubal abortion	1	
Tubal rupture	1	
Rectus muscle ruptured		1
Stomach—carcinoma leaking		1
Spinal cord tumour		1
Salpingitis		4
Spleen ruptured		1
Tonsillitis		1
Ulcer		19
Gastric	3	
Duodenal	11	
Gastrojejunal	2	
Perforated	3	
Urachal abscess	1	
Diagnosis not made		16
		200

Comment on Chart I.—This tabulation is self-explanatory. The diagnoses were shown to be right or wrong by surgery, by the clinical course, by autopsy and, in one case, by suicide. In addition to the 16 patients in whom a diagnosis was not made, there were 19 wrong diagnoses. This represents a minimum total of 35 patients (17.50%) who were not correctly diagnosed (Chart III). Because the diagnoses in all cases could not be proved, this percentage might be higher. A conservative estimate would seem to be that one patient in five was not correctly diagnosed.

Of special interest is the small number of acute appendicitis patients, the proportionately large number of patients with biliary disease, and the fact that a penetrating but non-perforating peptic ulcer can give pain severe enough to make one consider an acute surgical condition. It is also to be noted that rectal obstruction due to fæcal impaction can produce a severe obstructive type of pain of surgical proportions. The true incidence of non-structural (functional) abdominal pain, whether acute or chronic, is much higher than the 7% found in this small series. Some authors report an incidence as high as 50% for chronic pain. This "personality" factor must always be evaluated in any doubtful diagnostic problem.

The ileum and large bowel should also be considered more often. In the jejunum-ileum group, ten had a preoperative diagnosis of obstruction; two of acute distal ileitis, one of which was operated upon because of doubt; and three of acute diffuse enteritis (jejuno-ileitis. One of the colonic neuroses is a common cause of right lower quadrant pain. It is my opinion that it is probably the most common cause of pain in this location. Consideration of a pregnancy often solves a doubt, as also does consideration of the spinal and supra-diaphragmatic areas (diaphragmatic pleurisy).

Comment on Chart II.—Of the 19 patients in whom a wrong diagnosis was made, only one could be classed as really unavoidable. It was a clinical perforated duodenal ulcer. In other words, approximately 95% of the diagnostic mistakes were theoretically preventable. Seven patients had correct therapy and therefore did not suffer as a result. Twelve had wrong

CHART II.
WRONG DIAGNOSIS

Original diagnosis	*Correct diagnosis*	*Proved by*	*Avoidable*		*Fatality*		*Therapy*	
			Yes	*No*	*Yes*	*No*	*Right*	*Wrong*
Carcinoma of sigmoid	Postoperative adhesions	Surgery	x			x	x	
Biliary dyskenesia	Duodenal ulcer	Cl. course x-ray	x			x		x
Acute salpingitis	Endometriosis	Surgery 2 mos. later	x			x		x
Acute gastroenteritis	Pneumonia	X-ray Cl. course	x			x		x
Carcinoma of cæcum	Appendiceal abscess	Surgery	x			x	x	
Acute ileitis	Acute appendix	Surgery following revised diagnosis	x			x		x
Ruptured spleen	Acute œdema of pancreas	Surgery	x			x		x
Choledocholithiasis	Postoperative obstruction of common duct and duodenum	Surgery	x			x	x	
Duodenal ulcer (perforating?)	Duodenal ulcer plus fibrosing pancreatitis	Surgery	x(?)			x		x
Cholelithiasis	Carcinoma of pylorus	Surgery	x		x		x	
Carcinoma of stomach (penetrating)	Multiple gastric ulcers	Surgery	x			x	x	
Biliary colic	Gastrospasm	Surgery	x			x		x
Acute appendix	Normal appendix	Surgery	x(?)			x		x
Perforated duodenal ulcer	Perforation frustres (?)	Surgery		x		x	x	
Biliary colic	Duodenal ulcer	Surgery	x			x		x
Acute appendix	Endo. of ovary	Surgery	x			x	x	
Acute enteritis	Strangulation Ing. hernia	Surgery Cl. course	x		x		(too late)	x
Acute G.B.	Necrotic panc.	Autopsy	x		x			x(?)
Acute appendix	Ruptured right rectus muscle	Surgery	x			x		x

therapy, one of whom died as a result. One patient had doubtful therapy. It is reasonable to assume that these figures represent, more or less accurately, a rough percentage of error in the average abdominal diagnostic problem. The implication is obvious and serious.

CHART III.

INCORRECT DIAGNOSIS

Diagnosis not made	16	
Wrong diagnosis (Chart II.)	19	
Incorrect diagnoses	35	17.5%

Comment on Chart III.—This is too high a percentage of error. Much of it was preventable.

CHART IV.

WRONG DIAGNOSES: CAUSES

Incomplete investigation	17
Ignorance	6
Errors in judgment	9
Obsessions	8
Failure to think anatomically	9
Failure to think at all	3
Inherent difficulties in the case	0
Reluctance to accept responsibility	?
Wrong history from patient	1
Unavoidable	2
Diagnosis not made	61

Comment on Chart IV.—The causes of a mistaken diagnosis cannot always be placed in a single category, *e.g.*, it may be due to an obsession as well as to incomplete investigation. Thus, some errors have more than one cause and the total errors are therefore greater than the number of wrongly diagnosed cases. The most outstanding thing is that not a single mistake was due to the actual difficulties in a case. The chief cause of making a mistake was incomplete investigation. This cannot be stressed too much. Of much importance, also, is the wrong interpretation of the correct findings. Because this involves a personal factor it is hard to evaluate. It has been said that good judgment is the offspring of experience, and that experience is the offspring of poor judgment. Therefore, good judgment is a grandson of poor judgment. Thus the latter is a normal and necessary part of growing up, diagnostically, and must never be ridiculed unless persisted in. The real fault is in the failure to learn from mistakes, and the failure to always keep an open mind regarding all cases. Preconceived ideas (obsessions) are often difficult to correct because they are often unconscious. The open mind minimizes this possibility.

CHART V.

Correct diagnosis	*Wrong therapy*	*Fatal*	*Not fatal*
Fault of patient	1	1	0
Fault of physician	4	1	3
	5	2	3

Comment on Chart V.—Only one mistake in this group was the fault of that patient (20%): 80%, therefore, were the fault of the physician. The only instance in which the patient was to blame occurred because she refused surgery for complete jejunal obstruction due to a gallstone.

The four cases in which the surgeon was to blame are as follows:

1. Male, aged 73. Diagnosis: incarcerated bowel in hernial sac protruding through an older left rectus incision. There was no evidence of strangulation. Decompression therapy was of no avail, and surgical relief was attempted twelve hours after the first consultation. Many loops of densely adherent small bowel were separated. Death occurred soon after operation. No reason can be offered for not doing a simple aseptic enterostomy above the site of the obstruction, using a local anæsthetic. This is almost always the procedure of choice in such cases, in the absence of strangulation. It carries practically no mortality. This is a good example of being "physically present and mentally absent" at the operating table.

2. Male, aged 42. Diagnosis: Gastric neurosis. Previous gastroenterostomy elsewhere for duodenal ulcer. Shortly thereafter he had been told that his postoperative symptoms were due to a jejunal (stomal) ulcer. There was no evidence of this at the time of examination, and his free gastric acid unitage was low. In spite of these negative findings, operation was performed because of persistence of symptoms. The stomach was opened and the stoma thoroughly inspected. The findings were all negative and there was no evidence of the original duodenal ulcer. Symptoms continued following operation and disappeared only when he responded to psychotherapy.

3. Female, aged 47. Diagnosis: incomplete non-strangulating obstruction of the distal ileum. First seen at 11 p.m., when the pain was seven hours old. Decompression was instituted because there was no apparent evidence of strangulation and a flat scout plate revealed no evidence of obstruction. In the morning—but only nine hours later—a hard and tender mass was easily palpated by rectal, vaginal, and abdominal examinations. At operation a long segment of distal ileum was completely gangrenous. Resection was easily and quickly carried out and recovery was uninterrupted. This operation should have been performed nine hours earlier, and inasmuch as this is a critical analysis, it must be stated that it might have been, had the hour of the first examination been "a.m." rather than "p.m.".

4. Male, aged 47. Diagnosis (tentative): Incomplete non-strangulating (?) obstruction of distal ileum. This patient was "carefully observed" (?) for twelve hours. Even though symptoms were masked by previous injections of morphine, there was no excuse for this delay. Indeed, the fact that the "hypodermics" might have dulled the pain was enough to make operation imperative. Operation revealed a volvulus of the distal ileum. Resection was not performed, but later events showed that it would have been wiser. Recovery, which was stormy and delayed, included an enterostomy above the diseased gut which was probably fighting for its life in an easily palpable and tender abdominal mass. A "double-mistake" was thus allowed: delay of operation and inadequate therapy (non-resection at operation). When a segment of bowel has been so damaged that there is at

any time any doubt concerning its viability, even though it returns to an apparently normal appearance, it should be removed, unless there are sufficient contra-indications. Any such bowel has had sufficient injury in the mesenteric vessels to probably allow a thrombosis at a later date.

CHART VI.

ORIGIN OF PAIN

	Patients	*Approx. percentage*	
Outside of the abdomen	48	25	
Inside of the abdomen	141	70	
Medical	72		35
Surgical	69		35
Undetermined	11	5	

Comment on Chart VI.—From this summation it is seen that: (*a*) in approximately 25% of the patients, the pain originated outside the abdomen; (*b*) in approximately 35%, the pain originated within the abdomen but the therapy was medical. Many of these patients were treated surgically at a later date; (*c*) in only one-third of the patients (35%) was the pain the result of disease necessitating immediate surgical therapy. The medical intra-abdominal cases include ten in whom a definite diagnosis was not made, but in whom the pain was considered to originate within the belly cavity.

CHART VII.

Present history		*Approx. percentage*
Not satisfactory	9	5
Satisfactory	191	95

CHART VIII.

Past history		*Approx. percentage*
Related to diagnosis	157	75
Not related to diagnosis	43	25

Comments on Charts VII and VIII.—In only nine instances were the present history of the complaints not satisfactory. Therefore, in only 5% of cases would it be possible to blame the history for a wrong diagnosis. This, then, is one alibi that can no longer "hold water". The past history was important in arriving at a diagnosis in approximately 75% of the cases.

CHART IX.

Fatalities	9
Preventable	4
Non-preventable	5

Comment on Chart IX.—There is no comment necessary upon the fact that approximately 50% of the deaths could have been prevented.

SUMMARY

The diagnostic and therapeutic mistakes made in 200 patients suffering with acute abdominal pain are analyzed and briefly discussed. Even though the series is small, the following conclusions seem worthy of serious consideration.

1. The majority of the mistakes concerned small bowel obstruction. Every preventable death followed small bowel obstruction.

2. Nineteen cases were wrongly diagnosed (10% approximately). Only one was not avoidable. In addition, in 16 patients diagnosis was not made; thus 35 or 17.5% were incorrectly diagnosed. This is too high a percentage of error, much of it being preventable.

3. Of these 19 patients, seven had correct therapy and, therefore, did not suffer as a result. Eleven had wrong therapy due to the wrong diagnosis, one of whom died as a result—(small bowel strangulation and surgery 48 hours too late). One had doubtful therapy.

4. The most common cause of a wrong diagnosis was an incomplete investigation. Not one of the mistakes was due to actual difficulties in any case.

5. Five patients who had been diagnosed correctly were given wrong therapy. This was the fault of the physician in four cases (80% preventable). One death occurred as a result.

6. Only 35% of the patients required immediate surgical therapy. In approximately 25% the pain originated outside the abdomen proper. In approximately 35% the pain was intra-abdominal in origin, but medical in therapy. Many of this latter group were treated surgically at a later date. In 5% the origin of the pain was not determined.

7. The present history was satisfactory in 95% of the cases. This could not, therefore, be used as an excuse for a wrong diagnosis.

8. The past history, whether negative or positive, was of diagnostic aid in 75% of the cases.

9. Approximately 50% of the deaths were preventable.

Mass surveys are suitable case-finding techniques for pulmonary neoplasms provided they are interpreted with a high index of suspicion, are recognized as screening in nature, and are followed promptly by adequate diagnostic studies.—K. R. Boucot, *Am. Rev. Tuberc.*, **62:** 501, 1950.

CORRECTED TRANSPOSITION IN THE HEART OF A TEN MONTHS' INFANT

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CORRECTED transposition of the ventricles and great arteries is a very rare heart anomaly. The condition is quite compatible with life. The case of Walmsley[1] lived to the age of 35, doing fairly heavy work and dying of heart block. The lesser known Harvard case, studied by Lewis and Abbott[2] reached the age of 21, to die of tuberculosis. But in most of the few cases known, there are additional defects which shorten life expectancy. The pathologist then encounters a baffling combination of abnormalities.

From the standpoint of embryology, corrected transposition is the occurrence of two complete transpositions in the same heart, one of the great vessels and a second of the ventricles. In corrected transposition the external origins of the aorta and pulmonary artery are interchanged. This defect in an otherwise normal heart would lead the systemic blood back into the aorta, and separate the two circulations. In corrected transposition the internal orifices of the great vessels and the ventricles themselves are also reversed. The systemic blood passes from a normal right atrium into an apparent right ventricle that is really a transposed morphological left one, and then out through the true aortic orifice into a transposed pulmonary artery. In the same way the pulmonary blood passes from a normal left atrium into an apparent left (transposed right) ventricle and out through the true pulmonary conus into the transposed aorta. The two transpositions cancel out each other, and permit normal function of the heart.

The heart we are here concerned with came from a ten months old male infant, with a history of multiple heart murmurs, occasional attacks of cyanosis, and recurrent attacks of broncho-pneumonia ending in meningitis. The lungs and stomach are normal and the aortic arch and thoracic aorta take a normal course. There is no suggestion of situs inversus in any organ.

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The atria (Figs. 1 A, C) are altogether normal. The right atrium receives the two venæ cavæ and a small coronary sinus. The left atrium receives a single right and two left pulmonary veins. The interatrial septum, fossa ovalis, and limbus fossæ ovalis are normal, except that the septum stops short of the atrio-ventricular valves and leaves open the embryonic foramen I. The right atrio-ventricular valve (Fig. 1 D) is a continuous annular cusp, irregularly notched into leaflets. It looks more or less tricuspid. The left atrio-ventricular valve (Fig. 1 E) has at first sight three cusps; but the two medial ones are parts of a cleft septal cusp of a mitral valve. They have remained distinct because of an imperfect fusion of the embryonic dorsal and ventral atrio-ventricular endocardial cushions,—a well known anomaly. The left valve is therefore pretty clearly a mitral valve. The atria and atrio-ventricular valves in general are such as might be expected in an ordinary heart.

The ventricles are very unusual. The ventricle on the right side shows within the fine apical muscle meshwork so characteristic of the normal morphological left ventricle (Fig. 1 D). The larger left-side ventricle (Fig. 1 E) contains the coarse muscle ridges of a normal right ventricle. The left-side ventricle has also a pulmonary-like conus (Fig. 1, C, E). A crista supraventricularis and a moderator band are lacking. Except for these omissions the left-side ventricle has the external and internal appearance of a normal right ventricle.

The interventricular septum has a large foramen. The ventral part of the septum is reinforced by several anomalous muscle ridges on the right side (R in Fig. 1 D), and a strong muscle pillar on the left (C.m. in Fig. 1 D). These have no counterparts in the normal interventricular septum.

In general the two ventricles are transposed, and consequently connected with the wrong atria. Had nothing else been wrong, and had each morphological ventricle taken with it its normal artery, then the blood from the right atrium would have passed into the morphological left ventricle and out into the aorta. This would have resulted in a rare form of complete transposition, an example of which is given by Rokitansky[3] in his case 24.

But the two arteries also are transposed. The aorta arises from the pulmonary-like conus of

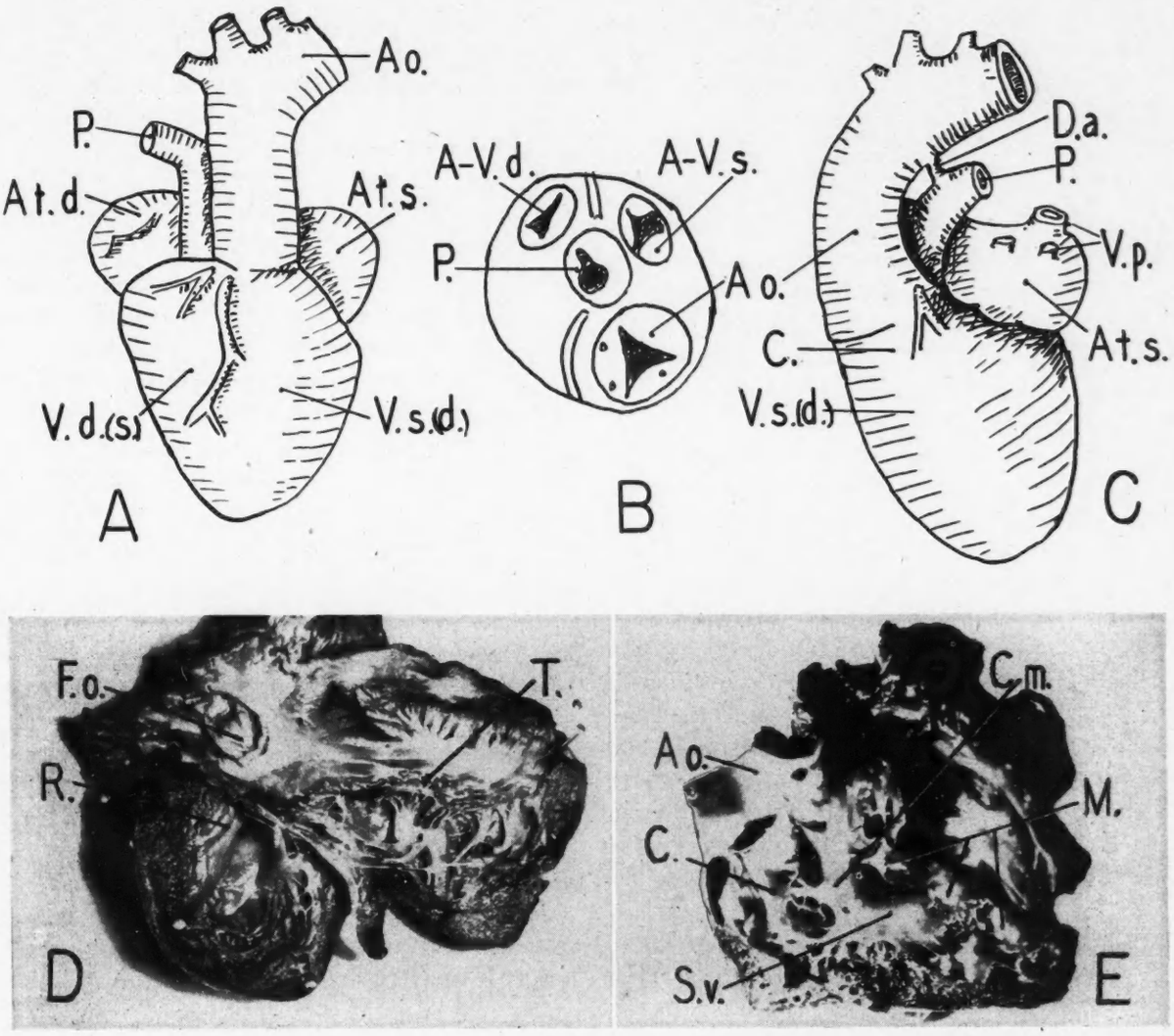

Fig. 1.—Heart from a ten months' infant showing corrected transposition of the ventricles and great vessels. A. Ventral view. B. Base of the ventricles. C. Left-side view. D. Interior of right-side ventricle. E. Interior of left-side ventricle. x ¾. Ao., aorta; A.-V.d., s., right and left atrio-ventricular canal; At.d., s., right and left atrium; C., conus; C.m., muscle pillar in left-side ventricle; D.a., ductus arteriosus; F.o., fossa ovalis; M., mitral valve; P., pulmonary artery; R., muscle ridges in right-side ventricle; S.v., inter-ventricular septum; T., tricuspid valve; V.d.(s.), right-side (morphological left) ventricle; V.s.(d.), left-side (morphological right) ventricle; V.p., pulmonary vein.

the left (morphological right) ventricle (Fig. 1 C). The pulmonary artery arises behind and slightly to the right of the aorta from the centre of the heart base. It over-rides the interventricular foramen exactly as does the aorta in Fallot's tetralogy (Fig. 1 A, B). Were the interventricular septum complete the pulmonary artery would arise from the right side (morphological left) ventricle. Such a transposition of the origins of the two arteries in an otherwise normal heart is characteristic of the usual form of complete transposition. In this heart the two transpositions cancel out each other and would permit a physiologically normal circulation, were there no other defects.

The other features of the great vessels are normal, or nearly so. The two arteries ascend parallel to each other. The pulmonary artery bifurcates behind the aortic arch, and its left branch is connected with the aortic arch by a small patent ductus arteriosus in the usual manner. The coronary arteries, two on the right and one left, supply the ventral and dorsal surfaces of the heart respectively.

As has been said, corrected transposition seldom happens without additional complications, and this heart is no exception. The semilunar valve cusps beneath the pulmonary artery are fused into a cone with a narrow aperture. This valvular stenosis with the open

interventricular foramen, and the over-riding pulmonary artery produced a clinical case of Fallot's tetralogy, which led to the death of the infant.

DISCUSSION

For the transposition of the ventricles two explanations have been offered. The dominant view today is that such transposition is caused by a local situs inversus, or mirror-image reversal, of the ventricles. Lewis and Abbott[2] have shown this to be a reasonable concept from the standpoint of embryology. Walmsley[1] has shown very clearly that in his heart not only the septal surfaces but also such unsymmetrical structures as the crista supraventricularis and the moderator band are the mirror-image of their normal selves. This and the general perfection of the heart argue very strongly for situs inversus in the Walmsley heart.

The older explanation for the transposition of the ventricles is that of Lochte,[4] who thought it to be caused by a twisting of the embryonic ventricular loop to the left, instead of to the usual right. Such a reversed twisting would produce more changes than simple mirror-image reversal. The ventricles would rotate a half circle about the atrio-ventricular valves as a pivot, and would reverse not only their right-left but also their dorsal-ventral surfaces. The rotation of the interventricular septum and the conus beneath the stationary atria would set up new mechanical conditions within the ventricles, which might affect the formation of the membranous septum and modify the crista supraventricularis and the moderator band, both of which are functional bands designed to hold down the great vessels.

On the whole, our heart lends itself better to Lochte's theory. Its ventricles show internal changes and special adaptations not found in simple situs inversus. The interventricular foramen is open with no trace of a membranous septum. The crista supraventricularis and the moderator band are absent. Their functions are taken over by anomalous muscle ridges in the right-side ventricle (Fig. 1 D), and a novel muscle pillar in the left-side ventricle (Fig. 1 E). Both appear designed to hold down the great vessels under unusual mechanical conditions, such as might follow a reversed twisting of the embryonic loop.

Not enough attention has been paid to the internal structure of the few recorded cases of corrected transposition. Several have highly defective interventricular septums. It is at least possible that some of these, like our own specimen, are the result of a left-hand twisting of the early ventricular loop, and not of a local situs inversus.

The reversal of the great arteries, and the attachment of the aorta to the morphological pulmonary conus must be due to the same cause that produces common complete transposition. The great vessels arise by a division of the early truncus arteriosus, and their reversed connection must be due to an abnormal attachment of the aortico-pulmonary septum of the heart conus. For this there are several explanations, which are too involved to be dealt with in a short communication.

SUMMARY

A heart showing corrected transposition from an otherwise normal ten months' infant is described. The atria and veins are normal. The ventricles are reversed. The ventricle on the right side has the internal structure of a normal left ventricle, and the ventricle on the left the pulmonary-like conus and internal structure of a usual right ventricle. The origins of the great arteries are reversed in addition, with the aorta arising from the pulmonary-like conus of the left-side ventricle, and the pulmonary artery from the heart base like an over-riding aorta. Superimposed upon this arrangement is a valvular stenosis of the pulmonary artery and a patent interventricular foramen which produced a clinical case of Fallot's tetralogy.

Corrected transposition is a combination of two separate defects, first a left-handed twist or situs inversus of the early ventricular loop, and second an abnormal division of the truncus arteriosus.

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A great deal of the confusion existing today in our understanding of the commoner forms of gastroenteritis is basically due to poor diagnostic terminology, in which unrelated syndromes seem synonymous, and related syndromes are often classified independently. It is suggested that the present trend toward etiologic diagnosis, employed to some extent by bacteriologists and health agencies, be utilized by the clinician, and that the laboratories be used to a greater extent as a diagnostic tool.—Milton Feig, *Am. J. Pub. Health*, **40**: 1372, 1950.

CASE REPORTS

FISH-BONE PERFORATION OF MECKEL'S DIVERTICULUM

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I would like to report a case which we had recently at our Hospital and which might be of some interest to the readers of the Journal. The case is unusual both from the nature of the foreign body producing the diverticulitis and perforation and the remarkable intermittent course of the attack.

A 70-year old fisherman was admitted to the Notre Dame Bay Memorial Hospital on February 20, 1950, complaining of intermittent attacks of sharp localized right lower quadrant pain for two weeks.

The onset had been sudden, beginning about 4.00 p.m., and lasting about one hour when it gradually subsided to a dull ache in the same area. Six days later he had a similar attack, the locale this time being mid-hypogastrium and the pain seemed to radiate into the perineum. This attack lasted about three hours. Next day he was symptomless and went into the woods to cut logs. The following day he had an attack of generalized abdominal pain which gradually subsided over about a ten hour period to a dull ache in the mid-hypogastrium. This persisted to the time of admission.

At no time during these attacks was there anorexia, nausea, or vomiting. He had a normal bowel movement daily without melæna. There were no urinary complaints. He had no fever or chills. He had had no previous episodes. The family and past histories were non-contributory.

On examination the following points were elicited. The patient was an elderly robust white male in no particular distress. Heart and lungs were negative. The abdomen moved well with respiration and was not distended or retracted. There was slight tenderness in the right lower quadrant the maximal zone being just medial to McBurney's point. There was some voluntary guarding in this area and moderate rebound pain. Rovsing's and psoas signs were negative. Rectal examination was negative. Temperature 99°, pulse 84, respiration 20. The blood pressure was 120/68. The urine was negative. The white blood count was 9,200.

A diagnosis of appendicitis was made and a laparotomy done. Although a very thorough search was made for the appendix none could be found and the characteristic cæcal bulge below the junction of the ileum with the ascending colon appeared to be absent. The patient had had no previous operation. On further exploration of the ileum a Meckel's diverticulum was located about 20 inches from the ileo-colic junction. Near the tip of the diverticulum was an area of reddening and induration of the serous surface about one inch in diameter flecked with exudate. Protruding from the centre of this area for about half an inch was a fish bone. This was extracted and a diverticulectomy done. No other pathology was discovered and the abdomen was closed without drainage.

The diverticulum measured 2.2 inches in length and 0.8 inches in diameter and had a well defined mesentery. The fish bone itself was very brittle and measured 2.5 inches in length by 1/12 inch in diameter. There was no free fluid in the abdomen nor any sign of peritoneal irritation other than that of the serosa covering the diverticulum. The patient made an uneventful recovery. The pathological diagnosis was: acute Meckel's diverticulitis with fish bone perforation.

IODODERMA ASSOCIATED WITH LOEFFLER'S SYNDROME*

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A generalized iododerma is rarely seen today. Its occurrence with an eosinophilic leucocytosis and pulmonary changes has not been previously described.

Mr. T, aged 25, was admitted to the indoor service of the Department of Dermatology, Montreal General Hospital, on May 8, 1949. His presenting complaints were coryza of 4 weeks' duration, cough for 3 days and a skin eruption for 1 week.

His past history was negative except for a severe pustular eruption of the hands and feet two years before. Only an occasional pustule was noted until the development of the present condition.

For the past 4 years he had taken 10 drops of iodine 2.5% in milk every second day. For the 10 weeks before admission he had taken 2 to 3 drops in milk twice daily for head colds.

Physical examination revealed a well-oriented, well developed individual who did not appear ill. His temperature was 101°. He was unable to breathe through his nose and coughed at frequent intervals. He also suffered from a mild degree of photophobia, lachrymation and blepharitis. His pharynx was œdematous and reddened with a few pustules on the hard palate, lips and tongue. The skin presented the greatest involvement. Scattered profusely over the scalp, face, trunk and extremities, including the palms and soles, were characteristic whitish pustules with an erythematous halo.

Laboratory investigation of urine and pustules was negative for iodine. Blood count on admission showed red blood cells 4.6 million, white blood cells 14,000, Hgb. 96%. No differential count was done at this time. Because of his cough repeated chest plates were obtained. The May 9, x-ray report (Dr. J. W. Mackay), stated: "There is bilateral advanced parenchymal disease. There is evidence of advanced infiltration involving the parenchyma of the entire upper lobe. There is involvement as well of the right lower lobe, the shadows here being broncho-pneumonic in distribution and occupying the right cardio-phrenic angle. The left upper lobe is similarly affected with a minimal lesion in the left lower lobe (Fig. 1)."

A second plate on May 11, was reported as follows: "The present examination shows a diminution in the extent of the lesions in the upper lobes, the one in the left lower lobe having completely resolved" (Fig. 2). At this time, on the basis of the x-ray findings, Dr. Mackay suggested a diagnosis of Loeffler's syndrome. The patient meanwhile had been discharged and on his return to the skin clinic on May 26, the blood count revealed the following: white blood cells 8,920, polymorphonuclear leucocytes 59%, lymphocytes 27%, mononuclear leucocytes 6%, eosinophils 8%. An x-ray of his chest on this date revealed normal findings (Fig. 3).

In an attempt to reproduce the above sequence of events, the patient was readmitted on June 2. During this admission, a patch test to 2% Tr. Iodine was negative and the sputum showed no eosinophils. After a stay of 5 days he was discharged because of his unwillingness to carry on with the experiment. A further check was made April, 1950, a year later, at which time x-ray examination of the chest and hæmogram revealed normal findings.

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* From the Department of Dermatology, Montreal General Hospital.

Read before the Annual Meeting of the Canadian Dermatological Association, Quebec, June 8, 1950.

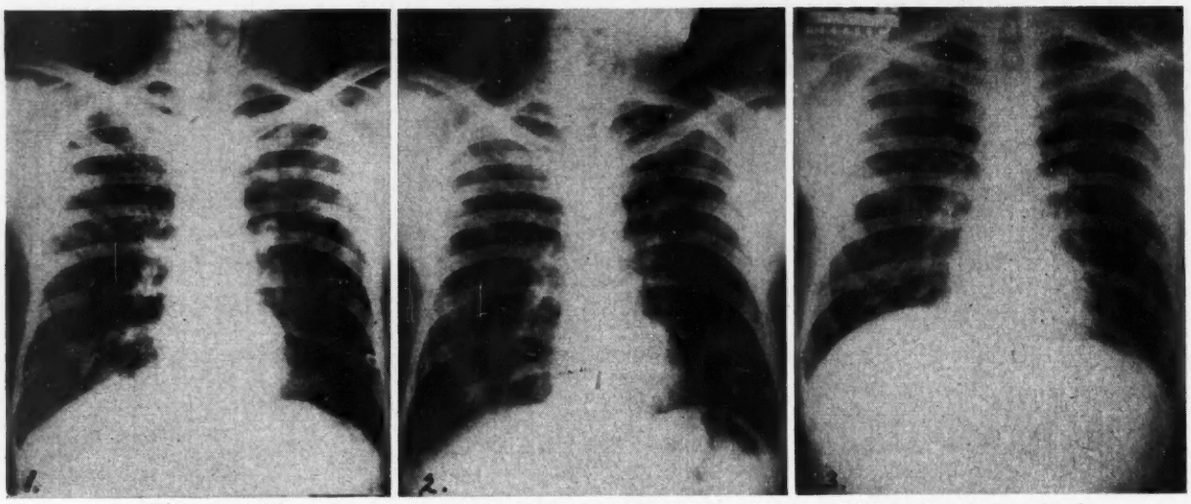

Fig. 1.—Diffuse involvement of right upper and lower lobes. Diffuse involvement of left upper lobe with minimal lesion in lower lobe. **Fig. 2.**—Note diminution in extent of involvement of both lungs. **Fig. 3.**—Normal appearance of chest.

DISCUSSION

In 1932 Loeffler reported a syndrome characterized by transitory pulmonary lesions, a remarkable increase in the eosinophilic leucocytes in the blood and a mild clinical course which is in striking contrast to the extensive pulmonary changes observed in the roentgenograms. Fever is variable, absent or up to 100°. The duration of the illness is usually 8 to 10 days.

The rapid changes and fleetingness of the radiologic shadows constitute the principal characteristics of this syndrome. Any zone of the lung may be affected, usually the subclavicular region. The extension of the radiologic shadow varies greatly. It may range from a small nodule to the entire pulmonary lobe or entire lung. The shape of the shadow varies. Differentiation from tuberculosis is at times difficult or impossible.

The pulmonary symptoms consist of cough ranging from slight to severe. There may be some pain of the pleuritic type. On physical examination of the chest little or no changes may be noted. Often there is only a slight impairment of the percussion note. Occasionally fine crepitant râles may be heard. Sputum is variable in amount, absent to profuse, usually only slight.

There is a constant eosinophilia which in most cases is moderate but may reach 66%. The number of eosinophils is said to be greater as the shadows begin to disappear. There is usually a leucocytosis up to 15,000 and an increase in the sedimentation rate.

The pathology has been studied by several observers. Microscopically, the foci may resemble bronchopneumonia or infarctions. The eosinophil count may be 70 to 100% of the exudate cells. Bone marrow studies have been few but they have shown a stimulation of the eosinophil myelopoiesis together with a certain lack of maturity.

Most observers agree that the condition is allergic in origin. Alpher has divided the etiologic factors listed in the literature into (1) the intrinsic group associated with infection such as tuberculosis, brucellosis, amœbiasis, ascaris, lumbricoides, fasciola hepatica, ancylostoma braziliense, necatur americanus, creeping eruption, and erythema multiforme as reported by Lehmann; and (2) the extrinsic group, associated with plant pollens and drugs such as sulfonamides. Iodine may now be added to this group.

SUMMARY

A case of iododerma is presented associated with an eosinophilic leucocytosis and transient pulmonary œdema. The findings in the skin, blood and lungs are believed to be an allergic response to the same etiologic factor, *i.e.*, iodine.

All patients with abnormal chest shadows which cannot be adequately explained on another basis should have the benefit of surgical exploration. To date, there is no cure for a primary lung cancer except its removal. Experience shows that, with the delay for symptoms and other loss of time, approximately 90% of the lesions have by that time extended to structures outside the lung; the possibility of cure, therefore, being limited to 10% in the symptomatic stage of the disease.—Richard H. Overholt, *Am. Rev. Tuberc.*, **62:** 491, 1950.

DERMAL MYIASIS IN EASTERN CANADA*

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Myiasis, an invasion of the tissues by the larvæ of dipterous insects, is rare in Canada. The present case due to the larvæ of *Wohlfahrtia Vigil* is reported in order to draw attention to the possibility of the occasional occurrence of similar cases in the Province of Quebec.

The patient, a well developed male infant, three months old, had previously been in good health. He lived with his parents in an outlying district of Montreal and it is of interest to note that the home was within 1½ miles of main railway tracks and adjacent to a river. Three days prior to admission, his parents had first noticed three small spots under the baby's chin. These resembled early boils. The following day they noticed four more on the front of the chest and one behind the left ear. These spots appeared to irritate the baby and it was noticed they occasionally "squirted out a drop of blood". On the day of admission the parents first saw the larva moving inside the lesion. On this day also the baby commenced to refuse feedings.

When admitted the rectal temperature was 99.4° F. and general examination entirely negative except for eight lesions distributed over the upper chest, neck and behind the left ear. These consisted of an indurated erythematous area about 1 cm. in diameter with a small central necrotic portion discharging some sero-purulent material. Although in a few reported cases two larvæ were found in a single lesion, in this case there was only one. The small and mobile larvæ 1½ mm. in diameter and 4 mm. long, were easily removed with forceps after partial extrusion by gentle pressure at the edge of the lesion. Great care was taken not to crush them owing to the possible danger of severe allergic reaction to the larval proteins. Another method of extraction is to apply 10% chloroform either by topical application or by injection into the punctum. In this way the larvæ may be removed more easily by gentle pressure or with forceps. After removal of all of them the lesions healed rapidly without any local treatment; 100,000 units of aqueous penicillin was given parenterally twice a day.

Wohlfahrtia Vigil has been found throughout Canada[1] except for west of the Rocky Mountains where it is replaced by *Wohlfahrtia Meigeni.*[2] *W. Vigil* is a non-bloodsucking fly a little larger than the common house-fly, but unlike this vector it is larviparous rather than oviparous. The larva, by virtue of its mandibular hooks, causes cutaneous myiasis manifested by furuncular swellings about the face, neck and chest, the secondary pyogenic infection not appearing to impede its growth. The parasitic action of these larvæ seems to be limited to the delicate broken skin of infants but it is possible that infection of the adult may occur in the unbroken skin or in skin softened by discharge.[9, 10] The fly has been found particularly in the vicinity of water and near railway tracks or other areas where the local temperature is raised. The female does not commonly enter houses but is attracted by porches and small shady areas which may resemble the burrows of its natural hosts, small mammals such as rabbits, foxes, dogs, cats and ferrets. The life cycle, including the larval stage and puparium is completed in approximately one month and the adult fly, after its emergence, lives for approximately five weeks.[3] The larva of this fly is identified by the two posterior spiracles which are situated in its posterior segment.[4] Less commonly, under suitable conditions of culture, it may be identified by rearing the adult fly.[3]

W. Vigil was first described by Walker of the University of Toronto and in 1931 he reported six cases occurring in Ontario and Manitoba since 1919.[1] Since then several cases have been reported in Ontario and Lewis[5] refers to an unpublished communication stating that they have occurred throughout Alberta. In the same report he describes a case from Saskatchewan. The fly is not limited to Canada, being found also in the Northern parts of the U.S.A. where several cases have been reported.[2, 6, 7] Recently, Israels[8] reported two further cases from Manitoba and reviewed the literature on Myiasis-producing Diptera. It should be noted that the great majority of these cases have occurred in the month of June.

We are indebted to Dr. T. W. M. Cameron, Director of Parasitology, McGill University who kindly aided in the final identification of the larvæ. We would also like to thank Dr. J. Gilbert Turner, Superintendent of the Royal Victoria Hospital and Dr. A. K. Geddes, under whose care the case was admitted, for permission to publish this report.

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TRUE MESENTERIC CYSTS

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Two cases of true mesenteric cysts are reported below; one gave symptoms of bowel obstruction by twisting of the intestine, and the other of a perforation, not of the cyst, but of the small bowel into the cyst.

CASE 1

R.G., a 6-year old boy, was apparently very well up to February 15, 1946, when, in the morning, he developed a rather dull pain in the right iliac fossa. He spent the day in bed, ate a little and slept quite well during the night. The following day, he was the same until 5 p.m., when the pain became more acute and generalized; he vomited twice. There was neither constipation nor diarrhœa.

Seen at 8 o'clock at night, he presented a distended and very painful abdomen, the maximum pain always being in the right iliac fossa. His temperature was 99.3° and his pulse 120. The diagnosis was acute appendicitis and the boy was admitted to l'Hôtel-Dieu de Québec.

On opening the abdomen a clear yellow liquid escaped under pressure; two quarts were aspirated. The appendix was normal, but exploration revealed a big blue mass between the layers of the small bowel mesentery in the jejunal portion; this mass was bilobed and the bowel was twisted between the lobes, each one being as big as an adult fist. Enucleation being impossible without injuring the intestine, an 8 inch resection was made followed by an end-to-end anastomosis and a repair of the mesentery. Appendectomy was done and the abdomen closed without drainage.

Recovery was uneventful and the boy was discharged on the tenth postoperative day; since then, his health has been perfect.

Pathological report (Dr. Carlton Auger). The specimen consists of a fragment of intestine with a portion of mesentery. There is a moderate œdema of the intestinal submucosa and the mesentery is enlarged, containing foci of chronic inflammatory infiltrate, areas of lipophagic granuloma and numerous cystic cavities of lymphatic origin (lymphangioma-chylangioma).

CASE 2

M.V., male, aged 5 years, had, during the summer of 1949, an attack of abdominal pain accompanied by diarrhœa, for a few days. The family physician made a diagnosis of gastro-enteritis. The pain and the diarrhœa disappeared and the boy was well up to November 26, 1949. That day, while playing, he felt an acute pain in his abdomen and had to stop; he went home and soon began to vomit. The pain and the vomiting subsided during the evening, but were more severe the following day, in the afternoon.

Examination during the evening revealed almost exactly the same signs as in case 1. The abdomen was wholly distended and the pain was so acute, above all in the right inferior quadrant, that it was nearly impossible to touch it. With a temperature of 100° and a pulse running at 120, a diagnosis of appendicular peritonitis was made and the patient was immediately admitted to l'Hôtel-Dieu de Québec. The leukocyte count was 14,000.

At operation instead of a diffuse peritonitis, we found a huge mesenteric cyst, developed between the layers of the small bowel mesentery towards the root of that mesentery and not at all movable. The cyst was found to extend very far to the left. It was opened on the right and nearly 1,000 c.c. of a creamy liquid were aspirated. The opening in the cyst was then enlarged and a perforation of 3 mm. of diameter in the small bowel was found, discharging into the cystic formation. The perforation was closed by a double row of catgut sutures.

Because it was impossible to remove the whole cyst by the incision and because the patient's condition was not too good, only a portion of the cyst was excised, with two cigarette drains put in the remaining part and coming out by a stab wound in the left, and the abdomen was closed in layers. Three days after, the boy was up, and on the 8th postoperative day, the drains were removed; there was no discharge of any kind, and the abdomen was normal.

However, thirty-six hours later, the patient began to vomit and to have some colicky pains; the temperature and the pulse were normal. Despite constant suction (Wangensteen), the pains and the abdominal distension became worse, and it was clear that a bowel obstruction was present and a second operation was urgent. This was done on December 8, through a left paramedian incision.

The loops of the small bowel were somewhat agglutinated, but the remaining part of the cyst was completely flattened. The obstruction was in the first part of the ileum near the cyst; by an intestinal resection followed by an end-to-end anastomosis, it was possible to remove the obstructed portion along with the remains of the cyst.

Three feet of a Levine tube were passed into the small bowel through an opening in the jejunum, the tube going outside the abdomen by a wound in the left flank. Two cigarette drains were left in the pelvis and the abdomen closed. During the operation, the patient's condition became very bad; he was then receiving blood and normal saline solution in 5% dextrose in a vein of the right arm, but the need for more blood being very urgent, a dissection of the inferior vena cava was made and 300 c.c. of whole blood were given at full speed. The condition became immediately better and the operation was resumed.

The following first days were a little stormy, vomiting occurring in despite of the constant suction and the jejunal tube. The gastric tube was taken off the 3rd postoperative day, food allowed by mouth and constant suction put on the jejunal tube. The bowels moved on the 5th day, afterwards the tube was closed at intervals; on the 7th day, it was possible to close it permanently; two days later, the drains were removed, the tube remaining in place one day more.

The boy was discharged the 14th day after the second operation, feeling perfectly well and has remained free from symptoms since that time.

Pathological report (Dr. Carlton Auger). First specimen: wall of a cyst composed of connective tissue and of smooth muscle-fibres with a sub-acute inflammatory infiltrate. The inner layer is covered by a fibrino-polynuclear membrane. There is no epithelial tissue, so a precise diagnosis is not possible; however, the tissues resembling those of an intestinal wall, we may consider the thing is an enterocystoma. Second specimen consists of a mass measuring 9.5 x 5 x 2.5 cm. composed of fibrous tissue with chronic inflammatory infiltrate and foci of giant-cell granuloma. In this mass, there is an intestinal fragment and also an irregular cystic cavity, with adjacent, numerous bundles of smooth muscle-fibres resembling intestinal musculosa.

ERRATUM.—In the paper on "Lipoma of the Choroid Plexus", by Ruth M. Barber, B.A., appearing in the Journal for November, 1950, p. 495, the lipoma was incorrectly described as "about 0.5 mm. in length". It was 0.5 cm. in length.

SPECIAL ARTICLE

GENERAL PRACTICE*

E. C. McCoy, M.D.
Vancouver, B.C.

PART II.

What measures could we undertake to meet the challenge of general practice and thereby improve medical service across Canada in the years ahead? This must of necessity be a long range program and one that will affect the young graduate and physicians yet unborn. It will involve the field of the student, the intern and the practising physician.

Such measures could be: 1. That an endeavour be made to incorporate into the undergraduate course the viewpoint of an improved modern type of general medical service at the family level.

2. An internship training program geared to the needs of the general practitioner. This must be one year, which is mandatory at present, with opportunities to extend to 2, 3 or 4 years. The general practitioner undoubtedly has the hardest job in medicine and usually has the least training for it, and most internships at present are geared for specialty training.

3. A very extensive and continuous postgraduate educational program. (*a*) University refresher courses. (*b*) A plan of continuous postgraduate clinics available to all groups (at county or provincial levels) in order that practitioners be kept abreast with modern medicine. (*c*) An endeavour should be made to organize the general practitioners to (1) educate themselves, *e.g.*, in small study groups; (2) teach the younger graduates.

4. An active endeavour to study and aid in the development of partnership and group practice of all sizes from two upward.

5. An active part should be taken in hospital organization. This is of lesser importance in a rural area as usually all doctors are on the staff but becomes of much greater importance in a city. There are several ways this could be accomplished. (*a*) We feel it is very important that every general practitioner should have access to some general hospital with the facilities of that hospital available to him. (*b*) He should be able to perform such procedures as he is capable of undertaking. (*c*) He should be represented in the administration of affairs in the hospital, *e.g.*, on the medical board. In most larger cities at the present time this is not possible as general practitioners cannot get above the status of "visiting or courtesy" staff—due to hospital rules and regulations—which very conveniently use the yardstick of certification for eligibility to their staff appointments. Health services have made remarkable progress during the past 25 to 50 years and this progress has been accompanied by the building of these services more and more around institutions, hospitals and groups of workers. This development is giving every member of the medical team a potentially more important rôle. Especially has this been true of the general practitioner, who has been provided with many more weapons for his fight against disease and injury. But to use these properly every doctor who aspires to deliver a modern medical service must have the use of a hospital. A doctor cannot adequately practise medicine today without hospital facilities and every doctor as he enters private practice should have some status on the staff of his neighbourhood hospital. It may be only a courtesy standing on the first rung of a ladder of merit that he may climb as his learning and experience increase—but he should have at least that status. It is simply not good enough that physicians are obliged to use the second and third rate facilities of nursing homes and private hospitals—it is not good enough for the profession as a whole or for the patients of qualified doctors.

THE AMERICAN ACADEMY OF GENERAL PRACTICE

Four or five years ago general practitioners in the U.S.A. became worried about the same problems and after some planning formed the American Academy of General Practice. This is an organization apart from the American Medical Association, and it has done much to raise the standards of general practice and to increase the prestige of general practitioners, and we feel that it has done much that can act as a guide to us. Much of what it has done is along the same lines as mentioned to you in our objectives outlined above. However, in a plan for integrating the family physician into the work of hospitals it has established the following four principles and we feel that these might well help to guide us in Canada.

1. The general practitioner should be in a position to work on the staff of all general hospitals, and evaluation of his clinical abilities should be based upon the quality of his individual training, skill, judgment and results.

2. The activities of the general practitioner should be in keeping with his training and experience and he should be expected to participate in any clinical service for which he can qualify.

3. The general practitioner because of his education, training and experience is ideally suited to conduct out-patient clinics in which diagnoses are made and patients referred if necessary to the appropriate clinical services.

4. On the in-patient service he should be integrated into the various specialty services and subject to their jurisdiction.

* Address delivered before the Saskatchewan Division, September 16, 1950.

Hospital plans for organizing general practice departments embodying these basic principles have been approved by Dr. McEachern, associate director of the American College of Surgeons. In these plans which aim at engaging the family doctor in hospital work in a manner satisfactory to all there is no service of general practice. All patients are admitted to the present existing services and family physicians are attached to those services. The focal point is the credentials committee which determines the basic privileges of the varying physicians.

The American Academy is also arranging postgraduate courses and has more or less set up standards for differentiating the general practitioner who tries to better himself and keep up with modern medicine from the man who gets in a rut and stays there. The movement is becoming very strong and last February there were over 5,000 general practitioners at their annual convention in St. Louis and they now have nearly 15,000 members.

In Canada, after considerable discussion, we have decided that a section of general practice of Canadian Medical Association is much more to be desired than a separate organization as in the U.S.A. We feel that a separate organization is much more likely to cause a split in the ranks of the medical profession and that would be a most unfortunate occurrence at the present time. The Canadian Medical Association feels the same way and at Halifax this year became very much interested in what we were doing and offered us their full co-operation and support. We were asked not to collect our own fees and were offered very reasonable financial support to get our movement under way. We were offered the part-time services of a secretary and as a matter of fact I am here today at the Canadian Medical Association's invitation and expense to acquaint you with what is going on.

In Halifax your general practitioner executive, under the chairmanship of Dr. Victor Johnston of Lucknow, Ontario, spent most of 2½ days in meetings. We drew up a constitution. There was much discussion as to whether membership should be selective or not. That is, whether we should set up standards, or whether all general practitioners should be able to become members. There are many arguments on both sides. However, we are trying to set up standards to better general practitioners and it was felt that to do this it must be on a selective basis. Hence we shall have two classes of members.

1. *Members* who must meet certain standards before being accepted, and who must maintain that membership every three years by doing at least 150 hours of postgraduate work.

2. *Associate members* which is open to all general practitioners who are members of the Canadian Medical Association on application. Such members cannot vote or hold office.

Committees were set up as follows: (1) Membership committee. (2) Hospital committee. (3) Public relations committee. (4) Economics committee. (5) Program and education committee.

The executive felt that it was too vital a matter to wait another year before meeting again, so they are holding a two day meeting in Toronto in January and as the executive consists of members from every province it should be well worthwhile.

The matter of certification of general practitioners has been discussed at great length and there are many points for and against. However we have come to the conclusion that we must consider certification of some sort for competent general practitioners. Hospitals have come to use the too-convenient yardstick of certification in making staff appointments and whether this is right or wrong it is very difficult to alter. This is one of the most compelling reasons why we must give some thought to the certification of competent family physicians. In the U.S.A. I feel that it will not be long until membership in the American Academy of General Practice will be considered a type of certification and probably something along the same line will develop from membership in the general practitioner section of Canadian Medical Association. However, when we ask for certificates we should have a clear conception of what a certified general practitioner is thoroughly capable of doing.

Representation is also being made to the Royal College of Canada to give more consideration to the fact that a man has spent time in general practice when setting up standards for specialty certification. We feel that a man who has spent 5 to 10 years in general practice with a special interest in one particular field should certainly not need a formal 4 or 5 year training in that field as would a young just graduated medical student. A secondary point is that the average general practitioner cannot afford to leave his established practice for such a length of time. We don't believe that standards should be lowered for certification, but we do believe they could be made more practical and could be done in such a way that we would probably get even a better class of certified man; *e.g.*, a general practitioner who had spent 5 to 10 years in general practice with a primary interest in, say, obstetrics and gynæcology, and who might also have spent 1 to 2 years in part-time apprenticeship with a certified man, should be able to get what formal training he needs in much less time than would the student recently graduated, although under present standards he does not.

We also hope to promote postgraduate training facilities. Concentrated courses of the most practical nature of 1 to 2 weeks' duration are

needed and Ontario has already made an excellent beginning with this and is now having regular courses in Toronto. Thus as you can see we have already made a good start in Canada, but to improve the field of general practice we must have the co-operation of all general practitioners or at least all of those who are interested in improvement. It is a sorry state of affairs when an article can be written like the one in the August number of *The Atlantic* under the title of "How good is your family doctor? written by a surgeon and who can criticize, as he did, 85% of the general practitioners that he knew. We are unable to say that he is wrong, although many of us believe he would have shown much better judgment had he published this in a medical journal for medical consumption rather than for the lay people to read and misconstrue.

In conclusion, I should like to again make it clear that I am here today representing the Canadian Medical Association General Practitioner section, and am presenting these problems to you for your consideration and to help you with your thinking.

we are attempting to work out solutions. We

we are attempting to work out solutions. We

are very definitely not a pressure group. We are not a group of radicals or malcontents. We are not a split-off-group: we are a part of the Canadian Medical Association. We recognize that there are many problems and many of these are far reaching in their implications, and we want your help and co-operation in working out a satisfactory solution.

Sir William Osler once said, "No undergraduate should have prouder ambitions than that of becoming a good general practitioner". One might doubt that he would say that today under present conditions. However we hope that were he to live again in 1960 or 1970 he might again justifiably make the same observation.

CLINICAL and LABORATORY NOTES

PRESCRIPTION FOR TWELVE G.P.'S*

H. J. G. Geggie, M.D., C.M.

Take one graduate nurse, of good and sufficient experience. No objection if she's good to look at!

Take one trained attendant, a good cook and a good housekeeper.

Take one social worker, male or female, expert in rural life, trained in city work.

Take one good midwife, of infinite patience and endurance, if possible a mother.

Rub these four together, and set away to mellow.

Then take one well-trained physician, one interested in infant feeding and pædiatrics, in acute infections and fevers, knowing small-pox, well versed in typhoid fever, interested also in Tb., Ca., cardiology, allergy, and having an aptitude with degenerative and chronic diseases and old people.

Also take you one surgeon, long on diagnosis, especially abdominal and gynæcological, short on using the knife, but resolute, sure and swift when he does. Interested he must be in orthopædics; and he must know the possibilities of neurology; gastro-enterology and urology; major and minor traumatic surgery and so on. One of these two must be practitioner of what I shall call "destructive dentistry", in other words he must be able to yank out a tooth, or a dozen of them with or without local or general anæsthetic.

Take too, a very good obstetrician, one having the good qualities of a midwife, one not too surgically minded, one able to row a river, climb a mountain and do his stuff solo, with a fainting husband, a coal oil lantern, and a mattress on the floor. I had a letter recently from a young lady for whom I had done these small services, asking me if I remembered her birth! I did!

One of these three must be a good anæsthetist, knowing the smell of ether, but well versed in the use, perhaps the abuse, of chloroform. He must know the use of sedatives, and be able to use modern intravenous Nembutal, Pentothal and also Nitrous Oxide. He need know only enough about ether and the modern explosive anæsthetics to leave them alone.

Take you one good eye, ear, nose and throat man, one who sees further than the tonsils and their removal, one who knows mastoids can still be infected in spite of anti-biotics.

These four must be thoroughly versed and interested in pharmacy.

There is no better way to save yourself money, and to save money for your patients than to know as much as you can about the drugs you use or the drugs you make your patients buy.

Then shall you rub together these four professionals, and again lay aside to mellow.

Take too one good sanitary engineer, one well versed in drainage systems; sewage, water and milk, food and air supply.

To him *add* a psychologist, one interested in psychiatry, but one who has not gone whoring too long after the modern concept of sparing the rod to avoid childhood inhibitions! I believe in inhibitions—else how could we get along with each other?

Also take a good lawyer, one with a sense of humour, able to make wills, knowing the transfer of property, the rights of women, the protection of children, the control of men.

Lastly, *take* one good priest, of any convenient sect, of liberal theology and wide sympathy, and perhaps humour; one able to baptise, give ghostly counsel, and to bury if need be.

Rub these four together and add to the former mass, which stir together lightly. It would be a mistake to mix it up too thoroughly to a uniform consistency, for no one wants all G.P.'s to be of a pattern. Thus in one would the surgeon predominate; in another the midwife-obstetrician; in yet another the family, municipal and social counsellor.

These spread freely across the landscape at 25-mile intervals; with or without hospitals or other help—except it be a good wife!

Thus will you bring modern medicine to the people. Thus will you make specialists and hospitals worthwhile.

* Excerpt from an address on General Practice delivered on February 21, 1950, by Dr. H. J. G. Geggie, to the Medical Undergraduate Society, *McGill Med. J.*, 19: 125, 1950.

THE CANADIAN MEDICAL ASSOCIATION

Editorial Offices—3640 University Street, Montreal

(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL

THE TRAINING OF SURGEONS IN HOSPITAL

TOO often we tend to regard hospital problems as being administrative only. That they may have an aspect of general interest, however, is shown by Dr. R. M. Janes in a recent comment* on the responsibility of hospitals and their surgical staffs in the training of residents. He shows that the smaller hospitals have difficulty in obtaining residents in surgery and, in order to attract men, are trying to become officially recognized as suitable for postgraduate training. But there can never be short cuts in training surgeons. A hospital must have more than the material requirements of beds, laboratories and equipment, if it is to train men. It must have a surgical staff which, in Dr. Janes' words,

> "must be composed of men who are capable of teaching not only the practical aspect of surgery, but something of the related basic sciences. In addition they must be men anxious to teach and sufficiently unselfish to be willing to devote many hours of their time to the training program, even though this involves a financial sacrifice. It is much more trying and time-consuming to assist a less experienced man from the other side of the table than to do the operation oneself. Nonetheless, this apparent waste of time must be accepted if one has assumed responsibility for the teaching of surgeons. In actual fact this apparent self-sacrifice carries its own reward in that the rapid increase in the capabilities of the resident makes it possible to throw a greater share of the responsibility upon him."

Dr. Janes brings out many other points. For example, since this postgraduate training is not only prolonged but is accompanied by little or no remuneration, it should be the very best type of training and not be made to include mere hospital routine. The selection of trainees should be made by the surgical staff, not the hospital superintendent. Private clinics occupy a debatable position in such training.

Hospitals which are not equipped for the training of surgeons, however, may still be included in a program for training general practitioners, which "is just as important as the training of surgeons, but the requirements are somewhat different".

Dr. Janes finally reminds us that there is a limit to the number of specially trained surgeons who may expect to find places: "the saturation point is in sight. It will be much better to emphasize quality rather than quantity."

It is timely to have this sympathetic and well-balanced view on a situation which so vitally concerns a large section of our hospital world, as well as involving medical education in its truest sense.

* *Ann. Surg.*, December, 1950.

THE APPRAISAL OF HOSPITALS

THE appraisal of hospitals is a most important and at the same time complicated matter, although it is probable that only a small proportion of the profession realize this. Canadian hospitals have always been appraised by the American College of Surgeons; we cannot be too grateful for their doing it so well. The possibility of their withdrawing from this work, as recently announced, was most disturbing. It is with great relief, therefore, that we now learn of their having reconsidered the matter, with the decision to continue as before. But the incident serves to emphasize a point of view which was brought out at our last annual meeting, even before the A.C.S. showed any signs of withdrawing. The question was asked at that meeting: is it not time for us to consider the possibility of carrying out our own hospital standardization or appraisal? A committee under Dr. Kirk Lyon was appointed to consider the matter and it has done much hard work. The whole undertaking is an extremely ambitious one, and could not possibly be considered without the participation and support of several different bodies. It is much too soon to do more than indicate that the Association through Dr. Lyon's committee is exploring the matter with the most careful consideration of all that is involved.

No change in the *status quo* is contemplated at present, but with the growth of our country it is natural to consider taking on more responsibility. Our Association feels that it should give the lead in things of this sort, even if it cannot itself directly carry them out.

EDITORIAL COMMENTS

Poland Withdraws From World Health Organization

The Communist method of misrepresentation is too well recognized to attract any special attention. But in the domain of medical affairs it has been less commonly employed, except perhaps for the phantasies claiming priority in well-known discoveries. It is then a further melancholy commentary on the thoroughness of the Communistic method that in conformity with it Poland has decided to withdraw from the World Health Organization.

In his letter to Dr. Brock Chisholm, Director-General of WHO, dated August 15, 1950, the Minister of Poland in Bern asserts that WHO has given "proof of its lack of faith in the principles which should guide its work, as well as of its complete surrender to the imperialistic States, and in particular to the United States", and states that "the Government of the Republic of Poland declines to take any responsibility for the orientation of the activities of WHO and for their submission to the imperialistic policy of the powers preparing a new war. . . ."

In its account of the incident the *Chronicle of The World Health Organization* lists the following forms of assistance rendered by WHO to Poland as a war-devastated country:

"A medical liaison officer was maintained in Poland until the autumn of 1948 to advise the national health administration and to arrange for WHO services. Poland received technical aid from WHO in its nationwide campaign against venereal diseases, and was assisted in the organization of a tuberculosis control scheme. WHO participated in the BCG-vaccination campaign in Poland. A consultant visited Poland to advise workers on streptomycin therapy and to work out a uniform scheme of reporting results, and a consultant on x-ray technology conducted demonstrations and assisted in the publication of a manual on x-ray techniques. Of a total of 800 fellowships awarded by WHO, 119 were received by Polish physicians; $26,000 was made available for this purpose for 1950.

"Other assistance included the supply of medical literature. So far Poland has received 704 medical books, 95 microfilms, and subscriptions or renewals to 241 periodicals. A medical team, composed of specialists from various countries, visited Poland under the joint auspices of WHO and the American Unitarian Service Committee. This team gave courses throughout the country and demonstrated some of the latest techniques in medicine and surgery. The team provided medical equipment and literature to Polish scientific centres and medical schools.

"Provision had been made in 1950 for supplies, equipment, and staff for a biochemistry training centre in Wroclaw and a venereal disease control training centre in Warsaw."

National Health Week

The Health League of Canada is again sponsoring its Annual Health Week for February 4 to 10, 1951. This has become one of the regular events of the medical calendar. The objects of the Health League are to promote health, and it feels that one way in which this can be done is by making Canadians "health conscious" and appreciative of the work of the medical profession "for the individual, the family, the community and the nation".

Complete information about the National Health Week observance may be obtained from the Health League of Canada, 111 Avenue Road, Toronto.

A Memorial to Dr. W. E. Gallie

Tennyson, speaking through Ulysses, said "I am a part of all that I have met". How true! And how important it is that we meet the right people as we journey through life. A new book just off the press, entitled "Essays in Surgery", provides an opportunity for fifty-eight surgeons and scientists to acknowledge their debt of gratitude to their friend, Dr. William Edward Gallie, an outstanding surgeon, an able teacher, a loyal colleague, an unselfish collaborator, and, above all, a gentleman embodying in a high degree those qualities of heart and mind which other men greatly desire and strive to emulate.

It is rare indeed that such a striking tribute is paid to one man by his fellows as is to be found in this volume which is presented to Dr. Gallie on the occasion of his retirement from the chair of Surgery of the University of Toronto.

During a lengthy and brilliant career, crowned by two outstanding appointments—Professor of Surgery and Dean of Medicine in his Alma Mater—many well-merited honours have been graciously accepted by Dr. Gallie, but surely none will be more appreciated by him than the publication of this unique and informative book in which the men whom he taught, with whom he laboured and who knew him best, have so clearly demonstrated the impact of a great mind upon others.

No doubt this volume, which will be reviewed elsewhere in the columns of the Journal, will attract much attention as a worth-while contribution to surgical literature, and they who read it will agree with the authors that it was their good fortune to be exposed to the wise counsel and inspirational influence of William Edward Gallie. T.C.R.

Correction.—The authors of "Mitral Occlusion Due to Mass Thrombus of the Left Auricle", published in the November issue wish to acknowledge the help of Dr. John Fisher, Professor of Pathology, University of Western Ontario, who kindly supplied the pathological data used in the report.

The Archer Memorial Window

The memory of the late Dr. A. E. Archer has been fittingly honoured by a memorial window, which was unveiled in the children's ward of the Lamont Hospital on Sunday, September 22, 1950 by Dr. George Johnson of Calgary, an old friend of Dr. Archer. At the same time the name of the hospital was changed to the Archer Memorial Hospital. Money for the window was donated by the friends of Dr. Archer, mostly residents of the Lamont district.

High tribute was paid to Dr. Archer by Dr. T. C. Routley, General Secretary of the Association, who referred to him as "an outstanding physician, humanitarian, gentleman and Christian". Mr. William Pedruchney, District Agriculturist, spoke of Dr. Archer's deep interest in the new Canadian people who came to the district as strangers. Perhaps the most impressive aspect of the ceremony was the large number and great variety of those who came from near and far to show their respect and affection for Dr. Archer.

MEDICAL ECONOMICS

The B.C. Division Reports

[*There is no harm in repeating a good thing. We are therefore reprinting the following editorial from the October 1950 issue of the "Bulletin of the Vancouver Medical Association".*—EDITOR.]

The recent Golden Jubilee meeting of the B.C. Medical Association was, as we think all must agree, one of the most successful and significant meetings that organization has ever held. In mere point of numbers, it is perhaps the largest —but that was by no means the only, or even the main idea of its success. Both in the clinical and in the economic fields, it must have impressed all who attended it.

The lectures were uniformly good . . . but it was the discussions on matters of economic and business interest that showed something of the progress that has been made during the past fifty years, in the thinking of the profession as a whole. Even twenty-five years ago, and we speak from personal knowledge, it was most difficult to arouse any interest, in the minds of the great majority of the profession, in economic matters, or to get any discussion in a general meeting. The majority of men neither knew nor cared very much about these things. A few men, who saw the vital importance of professional solidarity, and a better understanding by all medical men of the problems and danger that might face us, laboured with little recognition or thanks, as it seemed to many of us then.

Today, it is a very different state of things. The average medical man is becoming more and more aware of his responsibilities, not only to his patients, but to his fellow-practitioners and to the community as a whole. And the keen discussions, often acrimonious, we will admit, that kept men in their seats from nine in the morning till one or two the next morning, and then left room for twice as long a meeting, are proof that the concern of all of us is becoming keener and more informed; and it is good that it be so. We can settle differences—but nobody can make anything out of indifference.

Many things have contributed to this. Perhaps the first and most effective was the rough awak-

ening that we received in 1934, when Health Insurance, of a type which meant complete disaster, threatened us, and was only averted by the complete unanimity of the profession. Then there was the sterling work done by the Canadian Medical Association, which through the years has led and guided us, wisely and well. This parent body has worked loyally with its provincial divisions, giving due heed to their views, and considering carefully their individual needs. In this connection, we all acknowledge the help and benefit we have got from the general Council of the C.M.A., and especially from its General Secretary, T. C. Routley, whose wise and cautious advice we have all learned to value and respect.

Then, too, there is the tremendous amount of work that has been done, especially of late years, by the various Committees on Economics, who have given so freely of their time and energy—sacrificing a great deal of leisure and even more of working time, for the good of us all. It is invidious, here, to mention names: especially as this would mean a list that would far overflow our capacity. But they may feel justly that they are having their reward, as they see the growth of intelligent interest among the profession as a whole.

A highlight of the meeting for many men was the General Practitioner's sectional meetings. These were excellent and we believe will do much good. But we trust and hope that these meetings will always be held, as all medical meetings should be held, within the framework of organized Canadian medicine. The part can never be greater or more important than the whole and we must avoid, as we would the devil, any action that will tend to produce rifts between different sections of the profession. The medical profession needs unity more urgently than anything else. The example shown us by Great Britain should be enough to convince us of that, where the disunity of the profession—the separation into "upper and lower" classes of medical men, gave the lever to its enemies, which split it in two, and left it the relatively helpless thing it is today. We can settle our differences between ourselves but as a profession we must be united.

We are all medical men first—general practitioners or specialists afterwards. Time and patience and honest intent will settle all our problems, to the profit of all—but if we allow ourselves to be divided up into warring groups, we shall be easy prey to those who would gladly take advantage of the weakness that would be the result of such divisions.

What people say behind your back is your standing in the community.—Edgar Watson Howe.

ASSOCIATION NOTES

The Annual Meeting, Montreal, June 18 to 22, 1950

Visitors to Montreal are liable to forget that it is one of the largest ports on the continent. The accompanying picture gives some idea of how closely packed the wharves and warehouses are.

The best way to get an idea of the harbour and shipping is to drive across the Jacques Cartier Bridge, which can be seen dominating the eastern and southerly approaches of the city. (Incidentally, the Island of Montreal lies almost north and south, not east and west, leading to the well-known paradox that the south extremity of the Victoria Bridge is east of the north end). By the Jacques Cartier Bridge one can reach St. Helen's Island, named after the wife of one of the early governors of Montreal, and it is worth while stopping at the island to drive around it and see the river with the city across it. (See next page).

Another very picturesque drive is to the eastern end of the island, along the St. Lawrence, and turning back along the north side, following the so-called Back River. It has been questioned by some whether Jacques Cartier did not come up by this posterior channel rather than by the main stream. After all, to a small boat creeping up the St. Lawrence there was nothing then to say, keep to the left rather than the right. The current is about as strong on both sides at that end of the island. Still, the multitude of small islands below Montreal tend to keep shipping over to the south shore, where of course the dredged channel now is, and it is most likely that Jacques Cartier kept to the main stream.

An equally picturesque drive, but quite different in surroundings is around the west end of the island, by Ste. Anne de Bellevue and Senneville, Ste. Genevieve and Cartierville. The west end of the island is an almost entirely residential and farming district and is extremely attractive.

Of course there are many more drives, both south across the St. Lawrence and north into the Laurentians, but that is another and a very long story.

MEETING OF EXECUTIVE COMMITTEE

The Executive Committee met in Montreal on Monday and Tuesday, November 20 and 21, 1950, with the following present: Dr. Harris McPhedran (Chairman) and Drs. J. F. C. Anderson, Saskatoon; Norman H. Gosse, Halifax; H. B. Church, Aylmer, Que.; E. S. Mills, Montreal; J. C. Thomas, Vancouver; Harold Orr, Edmonton; E. A. McCusker, Regina; R. W. Richardson, Winnipeg; W. V. Johnston, Lucknow, Ont.; M. C. Harvey, Kitchener; E. K. Lyon, Leamington; R. Vance Ward, Montreal;

(Courtesy of Canadian Pacific Railway Company)

Aerial view of Montreal harbour looking east and north.

J. R. Lemieux, Quebec; Walter deM. Scriver, Montreal; D. A. Thompson, Bathurst; A. E. Blackett, New Glasgow; J. F. McNeill, Summerside; John Walsh, Manuels; H. E. MacDermot, Montreal, and T. C. Routley, Toronto.

The following is a summary of some of the highlights of the meeting:

Budget for 1951.—Consideration was given to planning the budget for 1951. Increased activities and the upward trend of costs necessitated a careful study of revenue and expenditures in order that the Association might be maintained in a healthy financial condition.

Public Relations.—The committee endeavoured to assess the value of the Public Relations program which has been carried on for the past year, in order that adequate plans might be made for the coming year.

The Journal.—Questions relating to the editorial and business side of the Journal were discussed. The Editorial Board was authorized to secure temporary assistance for the Editor, pending the selection of a well-qualified Assistant Editor. A number of suggestions were made for the improvement of the format of the Journal, and the Managing Editor was instructed to secure an estimate of the actual cost of such changes and report back to the next meeting of the Executive Committee.

The Arthritis Survey.—Arrangements were completed for a meeting of a joint committee composed of two representatives of the Canadian Medical Association, two representatives of the Canadian Arthritis and Rheumatism Society and two representatives of the Canadian Rheumatism Association to study the recommendations of the Arthritis Committee and report to the Executive Committee as to the best way of implementing these recommendations. This joint committee will meet on December 13, in Toronto.

Annual Meeting, Montreal, 1951.—The annual meeting to be held in the Mount Royal Hotel, Montreal, during the week of June 18, 1951, was carefully discussed. At this date, plans are well advanced and the necessary committees appointed.

Annual Meeting, Banff, 1952.—The Committee examined the preliminary plans for the annual meeting to be held in Banff Springs Hotel, during the week of June 9, 1952. The Committee approved the suggestion that the Chateau Lake Louise be reserved also for this meeting, and that

arrangements be made for the operation of a shuttle bus service between the two hotels.

Proposed Amendments to the Constitution and By-Laws.—A lengthy discussion took place in connection with a number of proposed amendments to the Constitution and By-Laws. These will come up for further discussion at the Spring meeting of the Executive Committee, and, if approved, will be presented to General Council next June.

Report of the Committee on Economics.—The Committee on Economics presented a progress report dealing with a national corporation for prepaid medical care, Government assistance to low income groups, and suggested closer liaison with chairmen of provincial Committees on Economics.

Section of General Practice.—Dr. W. V. Johnston presented a progress report on the organization of a Section of General Practice within the Canadian Medical Association. The proposed rules and regulations of the Section were submitted to the Committee on Constitution and By-Laws for examination. The members of the Executive Committee expressed themselves as sympathetic to the organization of this new Section within the structure of the Canadian Medical Association provided the Section adapts itself to the Constitution and By-Laws of the Canadian Medical Association. Another meeting of the Section will be held prior to the next meeting of the Executive Committee at which time it is hoped its organization will be completed.

Standardization and Approval of Hospitals for Canada.—Cognizance was taken of the report that the American College of Surgeons proposed discontinuing the approval and standardization of hospitals in Canada. If this were to happen it would be necessary for some other authority to take on this task as far as Canada is concerned. It was agreed that this whole matter be examined carefully by the appropriate organizations.

National Disaster Plan.—In connection with the present unsettled state of the world, consideration was given to the development of a master plan in the event of disaster; and, in order that the medical profession may take its proper rôle in the national disaster planning presently taking place, a committee was appointed to study the matter and advise the Divisions as to a standard plan for the medical profession across Canada.

Conference with Canadian Life Insurance Officers' Association.—The Executive Committee learned with satisfaction of the discussions which have been held between the Canadian Life Insurance Officers' Association and representatives of the Canadian Medical Association on matters pertaining to prepaid medical care and allied subjects, and approval was given to the setting up of a joint committee of the two Associations to give further study to the matter.

Prepaid Medical Care Plans.—The Committee had before it a number of problems arising out of the prepaid medical care plans, particularly in reference to activities which overlap provincial boundaries, thus making a national approach to the problem increasingly imperative. This matter is before the Committee on Economics.

Registration and Licensing of the Professions in Alberta.—The Committee learned with concern of a report from the Province of Alberta that the registering and licensing of the professions is to be taken over by the Provincial Government. Assurance was forwarded to the Alberta Division of our deep interest in this problem, not overlooking its possible national implications.

World Medical Association. — Dr. H. B. Church and Dr. D. A. Thompson presented a very interesting report of their attendance, as Canadian Medical Association delegates, at the fourth meeting of the World Medical Association held in New York in October. It was announced that the fifth meeting will be held in Sweden in September, 1951. The President, Dr. Norman H. Gosse, and the General Secretary were appointed official delegates to this meeting.

British Commonwealth Medical Conference.—The next British Commonwealth Medical Conference will be held in Johannesburg, South Africa, July 11 to 15, 1951. Dr. Walter Scriver of Montreal was appointed official delegate from the Canadian Medical Association to this Conference.

Reciprocal Arrangements with British Medical Association re Travel Funds. — Reciprocal arrangements have been made with the British Medical Association whereby funds on both sides of the water may be more readily available to trans-Atlantic visitors.

Medico-Legal Committee.—Arrangements with the legal profession, which are very cordial and harmonious, are being carried on by a joint committee under the Chairmanship of Dr. Kenneth Gray.

Increased Activities.—It is becoming increasingly apparent that the subjects coming under the purview of the Association require more and more time for discussion. It was therefore agreed that the Executive Committee would extend its usual meetings from two to three days; and the General Council which has previously sat for two days will have its program extended to three days—Monday, Tuesday and Wednesday.

Many other items were dealt with and altogether the Committee spent two very full days.

T. C. ROUTLEY,
General Secretary.

The by-product is sometimes more valuable than the product.—Havelock Eilis.

MEDICAL SOCIETIES

Nova Scotia Division

The Nova Scotia Division of the Canadian Medical Association held its annual meeting in Halifax September 4 and 5, 1950. Shorn of clinical lore and social adornment because of the meeting of the parent society in Halifax three months earlier, the sessions were devoted strictly to business. Perhaps this was good. There was ample time for discussion of the ever increasing business problems of medical practice and the discussion, while frequently verbose and sometimes irrelevant, was good democracy and democracy always is, in the end, productive.

Prominent on the agenda was the government allowance for the care of government dependent persons. Maritime Medical Care, Inc., which looks after the allowance, has had to pro rate accounts at from 70 to 50% and most opinions were that prorating would continue, with the percentage falling still lower. Speakers stated that the whole plan should be discarded and the government offer rejected. Some said that the profession was expected to mingle charity with their business and that the government payment should be retained in that spirit. There was criticism of abuses on the part of doctors whose accounts seemed high, and of patients whose means were such that they could well afford to pay their own accounts. There was also criticism of the government department which, it was felt, had not clearly presented the limitations of the scheme to the public and were advertising it as an all-embracing plan of free medical care. It was also felt that the travelling allowance of one dollar per mile on sick calls was too high in proportion to the money allotted. Finally, further consideration of the whole problem was left with a special committee with instructions to attempt to attain a larger allowance from the government and to consider a reduction in mileage payments.

A second problem demanding thought and full discussion was that of a full-time secretary for the division. Taking part in this and giving guidance were Dr. Arthur Kelly of the Canadian Medical Association and Dr. Frederick Wigmore, full-time secretary for the New Brunswick division, and President N. H. Gosse. It was the opinion of the meeting that with the many health plans of governments and individuals taking a greater and greater part in the doings of the profession, a secretary who could devote his full time to matters of professional business was becoming a necessity. As the problem was making its first appearance at a general session of the division, finalization was not possible but it was speeded enthusiastically on its way.

The Provincial Medical Board of Nova Scotia came in for some criticism because of its failure to have passed by the local legislature a bill to abolish the existing reciprocity between the Nova Scotia Medical Board licence to practice and that of the United Kingdom. It was felt that had the true situation been more clearly presented its reception would have been more favourable, and much adverse publicity which occurred reflecting on the profession as a whole, would have been avoided.

Nominees from the division were made to the house of delegates of Maritime Medical Care, the profession sponsored pre-paid medical scheme. Reports of standing and special committees were tabled and discussed. President E. F. Ross kept business moving at a pace unhurried and yet unlagging and by nightfall of the second day the sessions had reached a successful conclusion.

An important by-product of the meeting was the formation of a general practitioners' society. First officers for this group are: President, Dr. A. G. MacLeod, Dartmouth, N.S.; Secretary-Treasurer, Dr. A. W. Titus, Halifax; Executive, Dr. E. T. Granville and Dr. C. H. Reardon, Halifax.

A. L. MURPHY

La société médicale des hôpitaux universitaires de Québec

Société médicale des hôpitaux universitaires de Québec le septembre, 1950.

Considérations sur les anémies érythroblastiques de l'adulte.—Marcel Guay.

Le anémies érythroblastiques de l'adulte surviennent généralement comme complication, durant l'évolution d'un certain nombre d'entités cliniques. Notre première malade présentait une généralisation cancéreuse. Dans le deuxième cas, l'anémie érythroblastique était associée à un syndrome néphrotique. Notre dernière malade souffrait d'anémie érythroblastique que nous avons cru primitive, maladie de Di Guglielmo, mais l'épreuve thérapeutique semble éliminer cette hypothèse. La vitamine B12 donne un résultat inattendu, qui demeure inexplicable pour le présent.

Infiltration continue du splanchnique par voie péridurale.—Fernando Hudon.

Le grand splanchnique naît des 6, 7, 8, 9 ganglions thoraciques, le petit splanchnique naît des 10, 11 et 12 ganglions. Pour atteindre les fibres allant aux splanchniques, on introduit dans l'espace péridural lombaire supérieur un cathéter urétéral No 3½ ou 4 à l'aide de l'aiguille Tuohy, le biseau dirigé vers la tête. L'extrémité de la sonde est dirigée vers la 8 vertèbre thoracique. Nous suivons cette technique depuis l'an dernier. Une petite quantité de novocaïne à 1%, soit 10 cc., toutes les trois heures suffisent généralement pour enlever la douleur. Avec ce traitement quatre cas de pancréatite aiguë ont évolué favorablement. Quelques cas de dystonie biliaire ont été améliorés.

Indications.—Supprimer la douleur de la pancréatite aiguë et de l'infarctus du mésentère. Diminuer le choc péritonéal dans ces conditions, améliorer la circulation viscérale. Rétablir le désiquilibre neuro-végétatif avant que s'établissent les lésions anatomiques. Possibilité d'abolir la douleur intraitable des cancéreux par l'injection de novocaïne-alcool selon la méthode de Soresi.

Tuberculose cutanéo-osseuse: traitement par la vitamine D_2.—E. Gaumond, J. Grandbois et R. Therrien.

Dans ce travail, six observations de tuberculose cutanée et osseuse sont rapportées. Quatre des cas présentés concernent des Indiens du Labrador. Les difficultés du diagnostic par des examens de laboratoire sont exposées et les bons résultats obtenus par l'emploi d'une solution alcoolique de vitamine D_2 sont mis en évidence. Dans un cas il s'agissait de tuberculose bovine —démontrée par la culture du bacille. Les auteurs concluent en disant qu'on peut affirmer sans crainte de se tromper, après les bons résultats obtenus chez de nombreux malades, que la vitamine D_2 en solution alcoolique seule ou associée peut guérir la tuberculose cutanée et se montre très utile dans le traitement des tuberculoses osseuses.

Le 29 septembre, 1950.

Syndrome d'Unverricht: (Maladie familiale et héréditaire du système nerveux).—S. Caron et P. Michel.

La maladie a été décrite en 1891 par Unverricht et reprise par Lundborg en 1904. Elle débute dans l'enfance et dans la moitié des cas par des crises épileptiformes nocturnes qui récidivent à des intervalles plus ou moins rapprochés.

Il y a trois stades dans son évolution. (1) Stade épileptico-tétaniforme. (2) Stade myoclonie-épileptiforme: la myoclonie est généralisée, s'exagère à l'approche des crises d'épilepsie; celles-ci sont plus intenses le matin. L'intelligence diminue—somnolence. (3) Stade terminal ou marastique: l'épilepsie cesse, les secousses augmentent; état de demi-somnolence; rigidité et mort par épuisement, par état myoclonique ou épileptique ou maladies intercurrentes.

Dans le cas que nous présentons: Un frère âgé de 25 ans est grabataire depuis 10 ans environ, pour des tremblements, des crises convulsives, des troubles de la marche et de la dysarthrie. Une sœur âgée de 12 ans présente depuis 2 ans le même syndrome que son frère; tremblements, pertes de conscience, troubles de la marche et de la parole.

Cancers cérébraux métastatiques (observations).—S. Caron, L. Lemieux and A. Beaudry.

L'incidence des tumeurs cérébrales d'origine métastatique pouvant atteindre un taux aussi élevé que 27.2% justifie la présentation de 5 cas, avec vérification histopathologique pour tous. Les malades ont tous été admis porteurs d'un syndrôme neurologique. Tous ont présenté des troubles mentaux. Il n'y a pas de syndrome spécifiquement tumoral cérébro-métastatique. Il existe des signes positifs et négatifs, pouvant aider au diagnostic différentiel.

Ces signes ne dispensent pas le clinicien de faire un examen physique et radiologique complet de tout individu qui après 40 ans consulte pour troubles neurologiques, et de faire un dépistage soigné des cancers du poumon chez l'homme, du sein chez la femme, sources les plus fréquentes des tumeurs métastatiques du cerveau.

Pneumo-encéphalographie thérapeutique chez les arriérés mentaux.—J.-Chs. Miller et Jean Delâge.

Les auteurs ont soumis vingt enfants arriérés mentaux à la pneumo-encéphalographie. Ils ont constaté chez plusieurs une amélioration marquée surtout des troubles du comportement et du caractère, ainsi qu'une poussée de croissance. Le quotient intellectuel est demeuré à peu près le même, sauf une légère amélioration dans quelques cas. Ils n'ont eu aucun accident ou incident sérieux pendant ou après la pneumo-encéphalographie.

CANADIAN ARMED FORCES

News of the Medical Services

The Governor-General Viscount Alexander of Tunis conferred the insignia of The Venerable Order of The Hospital of St. John of Jerusalem (Officer Brother) upon Brigadier W. L. Coke, O.B.E., C.D., R.C.A.M.C., Director General of Medical Services (Army) and Group Captain A. A. G. Corbet, E.D., Director of Health Services, Royal Canadian Air Force, at Government House on November 14, 1950.

Medical Director General, Navy; Director General of Medical Services, Army; and Director of Health Services, Air; represented the Department of National Defence at the semi-annual meetings of the Defence Medical and Dental Services Advisory Board and the Medical Research Advisory Committee to the Defence Research Board.

The annual meeting of the Defence Medical Association was held in Ottawa, November 3 and 4. Guest speakers were Rear Admiral Joel T. Boone, M.C., United States Navy, and Mr. E. Reid, Deputy Under-Secretary of State for External Affairs. A new Constitution which had been prepared by a Committee under the Chairmanship of Lieut.-Col. Letourneau, was approved. Group Captain A. D. Kelly, R.C.A.F. Reserve, was elected as President for the coming year.

Surgeon Lieutenant D. G. Wood, R.C.N., recently joined *H.M.C.S. Nootka* which is proceeding to Korea for service with the forces of the United Nations.

Major M. Fitch, R.C.A.M.C. of the D.G.M.S. Directorate, Ottawa, attended the annual meeting of the American Public Health Association in St. Louis, Missouri, October 30 to November 3, 1950, as a representative of the three Armed Forces Medical Services.

Lieut.-Col. G. L. Morgan-Smith, O.B.E., C.D., Command Medical Officer, Prairie Command, Winnipeg, Manitoba, gave a talk entitled "Disaster Planning for Hospitals" to the Western Institute of Hospital Administrators in Winnipeg on October 10, 1950, and to the Alberta Hospital Association in Calgary on October 26, 1950.

Captain K. D. McQuaig, R.C.A.M.C., Ottawa; Capt. Y. Leclaire, R.C.A.M.C., Montreal; Captain A. C. Hardman, R.C.A.M.C., Edmonton and Captain W. R. Dalziel, M.C., R.C.A.M.C., Kingston Military Hospital, have been promoted to the rank of Major. Major J. W. R. Barr, R.C.A.M.C., Commandant The R.C.A.M.C. School, Camp Borden, Ontario, and Major D. W. Caldwell, R.C.A.M.C., D.G.M.S. Directorate, Ottawa, have been promoted to the rank of Lieutenant-Colonel.

The first course for R.C.A.F. Regular and Reserve Medical Officers was held at the Institute of Aviation Medicine, November 27 to December 2, 1950. The guest speaker was Colonel A. P. Gagge, Director of Medical Research, Office of the Surgeon General, United States Air Force. This comprehensive course was attended by approximately sixty medical officers.

Group Captain A. A. G. Corbet, attended the annual meeting of the Association of Military Surgeons of the United States in New York, November 9 to 11, 1950, representing the Medical Directors of the Navy, Army and R.C.A.F. In addition, Major E. E. Andrews, R.C.A.M.C., attended representing the Matrons-in-Chief of the three Services.

CORRESPONDENCE

Medical Evidence in Intoxication

To the Editor:

One night last June after I had gone to bed, I was asked by the police of a suburb of a large city to come to the station to examine a person accused of driving his car while under the influence of alcohol. My opinion was sought because of an official position I hold in the suburb. I found myself confronted by a man who had had an accident while driving home from a wedding reception and who was obviously "not himself". I spent one half hour with this man who was dishevelled, who had vomited, whose face was flushed, who had bloodshot eyes and semi-dilated pupils, whose speech was slurred and whose movements were unco-ordinated so that he could not walk, light a cigarette, pick up a match he dropped on the floor or write his name, and whose breath smelled strongly of liquor. His mood during this half hour was labile, ranging from threats to sue the police for vast sums to almost childlike giggling. I asked him if he understood why I was there and explained that he might care to call his own physician. I also told him that he need not submit to any test he did not wish to. At the end of my interview, I listed my findings and expressed my opinion that he was sufficiently under the influence of alcohol as not to be able to drive a car with safety. Since I had been asked to express an opinion and not to prove a charge, I took neither blood nor urine for analysis. The time interval from the accident to the end of my one half hour interview was sixty-two minutes.

Three months later I was called to the witness box and cross-questioned by a lawyer who had probably never before seen the accused until he was briefed by him, and I was made to answer quibbling questions such as, "What is the effect of fear on the pupil of the eye?" and "What percentage of alcohol in the blood constitutes

being drunk?'' The case dragged through four sessions and in the end, the accused was acquitted. The lawyer and the learned judge, having examined the evidence, found the prisoner not under the influence of alcohol on that night in June; the police and I, having examined the individual, know that he was.

It can readily be seen how far reaching the results of this and similar cases can be. Doctors will not go out at night to do clinical examinations only to have their judgment held up to ridicule by lay persons who were not even present at the critical time; the police will relax their vigilance on the grounds that it is not worth their while to book any obviously intoxicated person who seems likely to have sufficient means to employ counsel for his defence, and the accident rate due to alcohol will continue as before.

Therefore, if the courts are not going to accept medical testimony, we must have an arbitrary but at least fairly scientific measure as a standard of whether or not a person can reasonably be said to be intoxicated. A simple one is a breath test (as used, I believe, in Massachusetts) where a balloon is blown up and the breath examined. Any person having an alcohol content above a certain standard is said to be intoxicated regardless of his or her behaviour. Other suggested methods employ blood or urine. No test is without fallacy.

I am aware that this vexed question of how to prove a person intoxicated has exercised many minds and that no definite standard has been universally accepted. Different countries or states or provinces have different methods, some unnecessarily stringent, some very lax; and no one is able to define the words ''drunk'' or ''intoxicated'' or ''under the influence'' with legal exactitude. In England it is rare for a magistrate to give judgment against the clinical opinion of an unbiased medical observer, and the observations of the police are given consideration in keeping with the well-known impartiality of that excellent body. Such is not the case here.

I am writing this letter, Sir, because I am worried by the reaction of the police in question to these acquittals, since we employ police for our protection and have reason to be proud of them and thankful for their sense of duty, and I would like to have the opinion of my medical colleagues in this matter. Police do not bring a charge without having good reason to do so and one of their aims is to reduce the accidents that are caused by persons driving cars while under the influence of alcohol. After all, the next victim may be your child or mine.

Montreal. DONALD G. MACKAY.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

STREPTOMYCIN AND P.A.S.

The recently published Medical Research Council report on ''the treatment of pulmonary tuberculosis with streptomycin and para-amino-salicylic acid'' largely confirms the clinical impressions of most experienced workers in this field and marks yet another step forward in the battle against tuberculosis. The report is based upon the findings in 166 patients with acute progressive bilateral pulmonary tuberculosis, who were divided into three approximately equally sized groups: one group received P.A.S. (20 gm. of the sodium salt daily); one received streptomycin (1 gm. daily), whilst the third received streptomycin plus P.A.S. Those treated with P.A.S. fared much better than those patients with similar disease treated without chemotherapy in a previous M.R.C. trial. P.A.S. was less efficient than streptomycin. Improvement was somewhat better in the streptomycin plus P.A.S. group than in the streptomycin group, but the differences were small.

The outstanding effect of such combined therapy was a marked reduction in the incidence of streptomycin resistance. Some evidence of P.A.S. resistance was found, but much less frequently than in the case of streptomycin. It is clear therefore that until a further advance is made, P.A.S. has a definite place in the treatment of pulmonary tuberculosis. There still remains the problem of the relative status of P.A.S. and the thiosemicarbazones. This will presumably be tackled by the Medical Research Council in due course.

SEQUELÆ OF POLIOMYELITIS

Some interesting facts are revealed in an analysis which has just been published of a follow-up of all patients admitted to hospital with poliomyelitis in 1949. Only 37% of the patients were under the age of five years; 30% were over the age of fifteen. The death rate was just over 6%; the majority of the fatal cases were after the age of childhood. Some 10% of the patients had severe paralysis, whilst 18% had moderate paralysis. Of the total of about 8,000 patients admitted to hospital, 560 required treatment in ''iron lungs'.

An interesting sidelight is thrown on the difficulties of diagnosis by the fact that one-third of the patients admitted to hospital with the diagnosis of poliomyelitis were subsequently found to be suffering from some other disease. The analysis also shows that two out of every three cases ''are likely to suffer either no effects or to be left with a slight degree of paralysis which may pass almost unnoticed''.

MEDICAL EDUCATION

One of the major, and fully justified, criticisms of the modern medical curriculum is that it is too technical and is lacking in cultural background. There has been a tendency to lay the responsibility for this upon the headmasters of schools by accusing them of allowing their pupils to start specializing much too early. This challenge was taken up by Mr. Robert Birley, the Headmaster of Eton College, at a recent discussion on ''medical education'' at the Royal Society of Medicine. He made it absolutely clear that the blame cannot be laid upon the headmasters of the country, but upon a combination of the policy of the medical schools and the ever-increasing economic problem. How long should the medical curriculum be, and how much is to be compressed into this period? What has tended to happen of recent years is that the medical schools have taken the path of least resistance and quietly but steadily achieved the position that the First M.B. Professional Examination should be taken at school and that success in this examination should be an essential qualification for admission to a medical school. This, of course, has meant that schoolboys have had to start specializing in chemistry, physics and biology at the age of 15.

No one appreciates better than the headmasters what an appalling effect this has upon the ''education'' (in the true sense of the term) of the boys under their care, but they are in a hopeless position, as the alternative is for the boy to stay on an extra year at school or to spend an extra year at the university. This involves an additional expenditure which few parents can afford in these days of grinding taxation. The problem is a difficult one, but unless a solution is found fairly soon, the standards of the medical profession are going to suffer.

MEDICAL ASPECTS OF ATOMIC WARFARE

It is a grim commentary upon the atmosphere in which we are approaching yet another New Year that a medical journal (*The Practitioner*, December, 1950) should find it necessary to publish a symposium on ''Medical Aspects of Atomic Warfare''. Whatever may be our private views on the present state of world affairs, ranging as they do from moral disgust to complete cynicism, as doctors we have no alternative but to face the fact that atomic warfare is a possibility and that therefore we must be able to do all we can to deal with the consequences of such

a catastrophe. This particular symposium deals with the problem in an essentially practical manner. The theoretical aspects, such as the physics and the genetic effects of atomic energy, are outlined in an elementary manner, but the bulk of the symposium is given over to such matters as the treatment of radiation casualties, the casualty service, and the assessment of possible casualties and damage. All the contributors are experts in the subject, and the whole symposium provides the practitioner with an admirable survey of an unpleasantly important subject. WILLIAM A. R. THOMSON
London, December, 1950.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

The Use of Fluoroscopic Machines in Shoe-fitting. Statement by a sub-committee of the Committee on Public Health Relations of the New York Academy of Medicine: *Bull. New York Acad. Med.*, **26:** 757, 1950.

The sub-committee which furnishes this report has recommended that the Committee under which it functions should advise the Commissioner of Health and the Board of Health that the use of fluoroscopic machines for the fitting of shoes should be prohibited in New York City. The recommendation is based on

1. The potential dangers, particularly to children and shoe salesmen, which are inherent in the machines and their operation;
2. The absence of proof that the use of such machines contributes to accurate shoe-fitting, since they are not operated by persons qualified to recognize roengenographic abnormalities, and the poor visualization of soft tissues, especially in lighted rooms;
3. The impracticability of enforcing the requirements of the Sanitary Code relating to such machines and their operation, since adequate inspection, proper shielding and timing devices are generally lacking, and it is impossible to prevent customers from subjecting themselves to multiple exposures in a number of stores.

It is devoutly hoped that the report of the sub-committee achieves its aim. The public health authorities in Canada would do well to take cognizance of this danger and enforce similar prohibitive measures. It has sometimes been claimed that they cannot be blamed for failing to take action because those informed in such matters do not bring them to their attention. Such action is hereby taken. D. E. H. CLEVELAND

Withdrawal Treatment of Drug Addiction. Nyswander, M.: *New England J. Med.*, **242:** 128, 1950.

Morphine is suitable for the withdrawal treatment of all narcotic addiction unless the offending drug is a weaker one, such as demerol or codeine. Concomitant barbiturate addiction is the rule in all these patients and presents more of a problem in withdrawal than does the narcotic, and should be continued until the narcotic problem is dealt with. The amount of drug habitually employed by the addict can be disregarded in therapy.

Addicts should be hospitalized, their belongings carefully investigated for the presence of drugs (to the extent of the examination of the body orifices and the laundering of clothing to remove impregnated drugs), visitors should be prohibited and they should be under the care of experienced personnel. Morphine may be administered four times daily in dosage of one-quarter (rarely one-half) grain before meals and at bedtime. Gradual reduction of the amount of morphine with gradual substitution of codeine is carried out at two day intervals and finally thiamin chloride is substituted. Barbiturates are then gradually reduced. It is essential that the patient be unaware of the type or amount of drugs being used.

The physician must expect any type of alarming symptom to develop as a result of the patient's attempt to secure drugs. Subterfuges of all kinds may be attempted and must be suspected and guarded against. Psychotherapy is most efficacious during the period immediately following withdrawal and the usual required period of hospitalization will lie between six weeks and four months. NORMAN S. SKINNER

Vitamin B Excretion Studies in Patients with Rheumatoid Arthritis. Bayles, T. B., Palmer, R. J., Massod, M. F. and Judd, E. H.: *New England J. Med.*, **242:** 249, 1950.

The possibility of a deficiency of vitamin B in rheumatoid arthritis was first suggested by Steinberg in 1936 who found abnormal roentgenograms of the bowel which were corrected by administration of the vitamin. Race, in 1937, suggested that vitamin B deficiency produced thinning, atrophy and atonia of the gastric and intestinal membrane, leading to decreased food absorption with ultimate depletion of body reserves and increased susceptibility to secondary infection, possibly through the abnormal bowel wall.

To determine if a vitamin B deficiency existed in rheumatoid arthritis the authors, in a series of 40 patients at the Robert Breck Brigham Hospital, Boston, determined the fasting excretion of thiamine, riboflavin and nicotinic acid and also the excretion of these substances after administration of the vitamins. All patients had been on a standard hospital diet. Both the fasting and load excretions were found to be identical with that found in normal controls and hence no evidence of vitamin B deficiency in rheumatoid arthritis was demonstrated. NORMAN S. SKINNER

Obstetrics and Gynæcology

The Effect of Penicillin Vaginal Suppositories on Morbidity in Vaginal Hysterectomy and of the Vaginal Flora. Turner, S. J.: *Am. J. Obst. & Gynec.*, **60:** 806, 1950.

A cocoa-butter suppository containing 100,000 units of crystalline potassium penicillin G was inserted vaginally from 12 to 14 hours prior to operation in 100 consecutive non-selected vaginal hysterectomies. According to the American College of Surgeons standard of morbidity, this series had a 7% morbidity in contrast to the reported morbidities which vary from 26 to 42%. With employment of the same preoperative preparation prior to the use of the penicillin suppository, the morbidity in 56 personal vaginal hysterectomies was 37.5% and in a control series of 210 cases the morbidity rate was 34.8%.

The bacteriologic and clinical studies support the belief that penicillin vaginal suppositories are of value in reducing morbidity when employed as an adjunct in preoperative preparation in vaginal hysterectomy.
ROSS MITCHELL

Surgery

Pharyngeal Diverticulum. Dunhill, Sir T.: *Brit. J. Surg.*, **37:** 404, 1950.

From an extensive experience of the lesion, a thorough discussion of the anatomy, etiology, symptoms, prognosis, diagnosis and treatment, including details of the operation for the cure of pharyngeal pouch, makes this paper a valuable and concise monograph. The usually accepted theory that the diverticulum is the result of neuromuscular inco-ordination is questioned because it sometimes occurs in several members of one family, it is cured by operation without recurrence, and may be found in routine examination without any disability. A diverticulum is described in a child of 2 years. The symptoms vary: dysphagia, cough, gurgling noises, with loss of weight, pneumonia and regurgitation as late signs. The x-ray picture is characteristic. Carcinoma sometimes

develops in the pouch. The literature is discussed, as are the arguments for and against a one-stage or two-stage operation. The author prefers a collar incision, a one-stage operation and uses drainage by rubber tubes and ribbon gauze. Short notes on several cases conclude the paper. BURNS PLEWES

Carcinoma of the Gall Bladder. A Clinical and Pathologic Analysis of Fifty Cases. Jones, C. J.: *Ann. Surg.*, **132:** 110, 1950.

The incidence of carcinoma of the gall bladder in Montreal hospitals was 0.34% of autopsies and 1.16% of surgical operations on the biliary tract. Two-thirds of the patients had a history of less than six months. Jaundice of sudden onset occurred in 70%. Weight loss and constant pain were common complaints. Most had epigastric tenderness and in half a mass was felt. Most were over 50 years old. Histologically scirrhous and medullary types were most frequent. Papillary adenocarcinoma, mucoid and squamous cell carcinoma were also seen. Spread is by direct extension and by lymphatics. The liver was commonly invaded as were the cystic and periportal lymph nodes.

The preoperative or antemortem diagnosis was rarely correct. It seemed that those patients who first complained of severe constant pain had non-resectable tumours, as did those with marked weight loss. A palpable mass did not necessarily mean that the lesion was not resectable nor that it was not inflammatory in origin. The mortality rate of the series was 88%. Resection was possible in 14%, though in all but one distant extension of the tumour was found. The dismal prognosis found by other authors is thus confirmed in this series: carcinoma of the gall bladder is virtually an incurable disease. Doubt is expressed as to the wisdom of the dictum that stone-containing gall bladders should be removed in order to prevent carcinoma.

BURNS PLEWES

Psychiatry

Psychopathological Aspects of Deafness. Zekel, A.: *J. Nerv. & Ment. Dis.*, **112:** 322, 1950.

This is a report from the Deafness Department of the Vanderbilt Clinic in New York by a psychiatrist who was formerly director of the psychological laboratory at the Institute for the Deaf at Rotterdam. He presents 21 case histories of deaf individuals illustrating their emotional reactions to the handicap in relation to (1) degree of deafness; (2) duration of deafness; (3) age at which hearing loss started; (4) mental make-up prior to deafness; (5) influence of otological treatment and of psychotherapy; (6) other accompanying signs and symptoms, *e.g.*, noise, discharge, dizziness.

He concludes that the first two factors are directly contributory to the severity of emotional problems; that the nature of the maladjustment is different if deafness has existed from childhood; and that freedom from neurotic difficulties prior to deafness predisposes to a more healthy acceptance of the handicap, but that some neurotic difficulties are so universally present that a tendency to deny the deafness, with resultant resistance of treatment, of hearing aides, of lip reading training, and of psychotherapy for the maladjustment, is very common. The deafness becomes used in a neurotic way by the individual, who further isolates himself from the rest of the world, with whom he has difficulty in communication. The deaf person suffers from the lack of social outlets for immature as well as mature personality needs. Even if otological methods of treatment may not promise permanent cure, they may make the person temporarily more capable of using psychotherapy and of learning to avoid the maladjustment with the recurrence of the deafness. Depressive and paranoid reaction have been described as being common among deaf individuals. The author considers these tendencies, far from universal with deafness, as manifestations of regression to a narcissistic adjustment made more likely if difficulty in communication with others has overburdened the individual's previously somewhat anxiety ridden interpersonal relationships. The results of the psychotherapy which the author describes to help the deaf person to be more happy appear very satisfactory. W. DONALD ROSS

The Psychiatrist and the Cancer Patient. Trawick, J. D.: *Dis. Nerv. System*, **11:** 278, 1950.

This is a profound and provocative article which is written somewhat obscurely, so that its deep significance may not be readily appreciated by the general physician for whom it has tremendous implications with regard to the traditional medical attitude to malignant disease. The author questions the usual policy of withholding from the patient the knowledge that he has malignant disease. He attributes this policy to an unrealistic, emotional attitude which the doctor shares with a large proportion of people in our culture. He quotes a case of a doctor who was very maladjusted to his malignant disease while the knowledge of its nature was withheld from him by his physician sons, but who accepted it courageously when he was given the respect of a frank diagnosis. Two cases are quoted of cancer phobias which illustrate the psychodynamics of the morbid fear of the disease. "Cancer" is conceived of as a "horrible eating disease that gnaws you to death" and as "the most horrible thing that could ever happen to anyone". Since the lethal tendency of carcinoma is due to its invasiveness, and not to "cannibalism" of other tissues, and since worse things can happen to one in terms of one's self-respect, these conceptions are not realistic. The doctor's efforts to protect his patients from awareness of malignant disease often stem from his own unconscious acceptance of these unrealistic assumptions, and they prevent him from handling each patient in accordance with the ability of that patient to face reality in his own best interests. W. DONALD ROSS

Dermatology

Lipomelanic Reticulosis. Agress, C. M. and Fishman, H. C.: *J. A. M. A.*, **143:** 957, 1950.

This disease is commonly confused with Hodgkin's disease, although the histologic changes in the enlarged lymph-nodes bear very little resemblance to it, and Reed-Sternberg cells are absent. Although the disease was described by Pautrier and Woringer of Strasbourg, with a presentation of 11 cases in 1937, few cases have publicly been reported since. Nevertheless it is relatively common, and it is important that dermatologists, internists and pathologists should be familiar with it. The usual clinical picture is that of a more or less generalized lichenified eczematous eruption of prolonged duration and darkening of the skin, and extensive lymphadenopathy. The histologic changes in the skin present much variety but are not typical of any particular dermatosis. The lymph-nodes show irregular disorganization of the architecture, proliferation of reticular tissue, eosinophils, histiocytes and melanin, free and in melanophores, and considerable lymphoid material. It is important that it be distinguished from the lymphomas such as Hodgkin's, which bear a dire prognosis in contrast to this condition. D. E. H. CLEVELAND

Successful Treatment of Hyperhidrosis Using Banthine. Grimson, K. S., Lyons, C. K., Watkins, W. T. and Callaway, J. L.: *J. A. M. A.*, **143:** 1331, 1950.

Banthine (Searle) is a new parasympatholytic or anticholinergic drug which has been used in the Department of Surgery of Duke University School of Medicine in peptic ulcers and other gastro-intestinal disorders. In the course of treatment of 144 such cases several commented on the dryness of their hands and the Department of Dermatology was thus prompted to treat hyperhidrosis with this drug. The methods of treating excessive regional sweating by other means, including sympathectomy, have not been entirely satisfactory: 4 women between the ages of 27 and 30 were treated for excessive sweating of hands, feet and axillæ with very satisfactory

results. The dose was from 50 to 75 mgm. every 4 hours; occasionally, under special stresses 100 mgm. was given, and the patient soon learned to regulate the dosage according to necessity. The only side-effects were dilatation of the pupil, dryness of the mouth and moderate tendency toward constipation. The control of the hyperhidrosis was very gratifying to the patients and the drug was well tolerated. D. E. H. CLEVELAND

Industrial Medicine

Smoke. Shaw, J. W.: *Am. Indust. Hyg. Ass. Quart.*, **11:** 49, 1950.

This article is one of the papers presented at the Air Pollution Institute, February 6 to 8, University of Michigan, School of Public Health, Ann Arbor, Michigan. In it the author examines the salient points regarding smoke.

That complete, efficient and smokeless combustion can be accomplished by the proper installation of adequate equipment properly maintained and operated with the use of the kind of fuel for which the equipment was designed, is the opinion expressed in this article. Smoke is defined as "a product of combustion in the form of a mass consisting of very fine particles or molecules of free carbon suspended in a mixture of air and gas". It results from the heating of hydrocarbons in an atmosphere which is deficient in the supply of oxygen. The three broad basic causes for it are improper equipment, faulty operation, and unfit fuel. The importance of sufficient temperature and an adequate supply of oxygen is emphasized. Where temperature and oxygen are present in the proper proportionate quantities, the result is efficient and smokeless operation.

The major contributing source of smoke is bituminous coal, known 700 years ago, and referred to in the ordinances of that time as "sea coal". This coal can, however, be burned smokelessly where proper equipment is installed and maintained. Oil and gas are not smokeless fuels but it is a simple matter to design equipment that will burn them smokelessly. Some solid fuels, such as anthracite, coke and charcoal do not produce dense smoke no matter how they are burned.

Reference is made to the various panacea chemicals on the market, which are intended for use with coal to prevent soot or smoke. In the author's opinion, most of these are useless.

Specific fundamentals as to equipment, fuels and operation are indicated, with brief reference to the basic reason for the burning of fuel and the necessity for a full understanding of this fundamental concept, and, to the methods of classifying common types of boilers and furnaces. MARGARET H. WILTON

Incidence and Treatment of Neurosis in Industry. Ling, T. M., Purser, J. A. and Rees, E. W.: *Brit. M. J.*, **11:** 159, 1950.

In this article the authors present some aspects of industrial neurosis and suggest measures for dealing with the problem. That psychiatric and psychosomatic conditions comprise many of the recurring and chronic forms of illness, is becoming increasingly recognized. Not sufficiently appreciated, however, is their occupational aspect. Figures are given to show the incidence of neurosis among working groups of the population as found by various investigators and reported in the literature. The most recent are those from a report of the Industrial Health Research Board in 1947 regarding a survey among workers in 13 engineering factories in Birmingham. It was found that 9.1% of the men and 13% of the women had suffered from definite and disabling neurotic illness during the course of six months. In the same period a further 19% of the men and 23% of the women had minor forms of neurosis. Of all absence from work due to ill-health, neurotic illness had caused between one-quarter and one-third.

In considering the question of prevention of industrial neurosis the authors show the inter-relationships of psychosomatic conditions and the working environment, and stress the need for a comprehensive preventive program. They urge that hospital and out-patient staffs, both general and psychiatric, should have a better understanding of the occupational problems of their neighbouring industries in order to interpret the occupational background of their patients. It is obvious to them that an important field of prevention lies in the factory. References are quoted from the literature to show improvement following treatment in a neurosis clinic. At the Roffey Park Rehabilitation Centre, Horsham, Sussex, treatment and resettlement facilities are provided for early cases of neurosis in which employment seems a relevant factor. Here too has been established a beginning in mutual understanding between industry and hospital. Already 540 works managers and supervisors, and 122 doctors have received teaching in human relations in industry, given at Roffey Park.

Analysis of the after-effects of treatment is given for the year 1948. Of 512 patients all of whom had been discharged from Roffey Park between six and twelve months, 33.8% reported by letter that they were much improved; 44.7% were improved, and 21.5% were unimproved. Reports of 85 cases were obtained from full-time medical officers of certain firms. These reports indicated the occupational capacity. They were as follows: 54.1% much improved and working full-time; 37.7% improved and working full-time, and 8.2% unimproved or had left the company. MARGARET H. WILTON

OBITUARIES

Dr. Annie Belle Alguire died on October 8 in Belvidere, Illinois. She was 82 years of age. She was born at Caintown and a graduate of Queen's University. Dr. Alguire was one of the few women to study medicine in the 19th century. She practiced for two years in Gananoque before going to the U.S.A. in 1898 to practice medicine with her husband Dr. Alden Alguire, who predeceased her in 1935. She was known widely as a physician, songwriter, poet and inventor.

Dr. John Knox Blair, aged 77, died suddenly in Guelph on November 11. Born in East Luther Township, Dr. Blair attended the University of Toronto, where he obtained his degree of M.D. After interning in the Toronto General Hospital, he established a practice at Rosemount. Six years later he moved to Arthur, where he operated his practice until he retired. Dr. Blair was elected M.P. for Wellington in 1930 and was re-elected in two successive general elections.

He leaves his widow and three sons.

Dr. Joseph Boulay est décédé le 21 octobre à Sutton, Québec, à l'âge de 60 ans. Ce typique médecin de campagne, depuis près de trente ans, exerçait sa profession dans cette localité. Le défunt laisse dans le deuil autre son épouse, quatre fils.

Dr. W. Chapman Brown, aged 76, died at Toronto on November 14. Dr. Brown was born at Bonarlaw, Hastings County. He was a graduate of Queen's University and practiced for more than 40 years in Toronto. Wife predeceased him.

Dr. Margaret Douglas French, aged 73, died in Saskatoon on November 14. Dr. French came to Saskatoon from Shellbrook and practiced her profession here until retirement six years ago due to ill health. At Shellbrook, she was medical health officer for Shellbrook and Parkside for 12 years after her arrival in Canada from England. A great lover of animals, Dr. French was an active member of the Humane Society during her residence here and also was a familiar figure at kennel club shows and field trials for many years. During the depression years she worked with the city health department. Dr. French was born near Lyndhurst, Hampshire,

England and graduated from the University of Durham medical college in 1904.

She is survived by a brother, William D. French, and a sister, Mrs. Ethel Walker, both in England.

Dr. Edgar W. Hayden of Cobourg, one of the oldest practising physicians in Ontario, died in Toronto General Hospital on November 1, aged 78. Born in Cobourg, Dr. Hayden was educated at old Victoria College and graduated in medicine from McGill University in 1883. He leaves his widow, two sons and one daughter.

Dr. Donald Alexander Hingston died at his home in Westmount, November 18, at the age of 72.

Dr. Hingston was born in Montreal on April 5, 1878. He studied at St. Mary's College and was awarded his B.A. degree from Laval University here in 1898 and his M.D. from the same university in 1901. He served his internship at Royal Victoria Hospital and Hotel Dieu and at Edinburgh, later doing postgraduate work at Paris and Vienna. When he came back to Canada he joined the Hotel Dieu, where his father was surgeon-in-chief. During the Great War he served overseas with the No. 3 General Hospital under Brig. Gen. H. S. Birkett, holding the rank of captain. In 1934 he was named surgeon-in-chief at the Hotel Dieu and when he retired in 1948 was honoured with the title of honorary surgeon-in-chief. For many years he was surgeon-in-chief of St. Mary's Hospital. He was a professor of anatomy at the University of Montreal for many years and also lectured in surgery. At the time of his death he was a trustee of the university. He was also a member of the Montreal Medico-Chirurgical Society. He was made a member of the Royal College of Surgeons (England) in 1903 and a Fellow of the Royal College of Surgeons (Edinburgh) the following year. He was also a Fellow of the American College of Surgeons and of the Royal College of Surgeons of Canada.

Dr. Hingston was elected a director of the Montreal City and District Savings Bank in 1912, was made vice-president in 1934 and president in 1942. He was a member of the Mount Royal, Mount Bruno, University and Montreal Racket Clubs.

He leaves his widow and five daughters.

Maj.-Gen. Robert Marsden Luton, aged 59, director of medical services for the Canadian army overseas during the Second World War, died in Ottawa on November 20, 1950, after a short illness. The general, who lived in Chester, N.B., since his retirement from the army several years ago, had attended the recent annual meeting of the Defence Medical Association and was visiting his daughter when he suffered a heart attack. Born in St. Thomas, Ont., Gen. Luton graduated in medicine from the University of Western Ontario. Prior to the First World War he served in the ranks of No. 15 Field Ambulance, Canadian Army Medical Corps, for four years. He received his commission as lieutenant in 1914 and went overseas with the Canadian Expeditionary Force in February, 1915, as a captain. He served in France and Belgium from March, 1915 to December, 1916 when he was invalided to England. A year later he was promoted major and employed on medical service in England and Canada until December, 1919. He was awarded the Military Cross for gallantry under fire.

During his 35 years with Canada's military medical services, Gen. Luton held the appointment of deputy director of medical services at headquarters from May, 1930 until October, 1935. He then assumed duties as district medical officer for Military District No. 6 at Halifax, where he remained until the outbreak of the Second World War. He went overseas in October, 1939, serving at Canadian military headquarters in London, first as senior medical officer and later as deputy director of medical services. He became director of medical services in February, 1941.

Dr. J. W. Mackie died at Rochester, New York, on October 1. He was born in 1889 and graduated in medicine in 1914 from Queen's University. He saw service with the Canadian Medical Corps in the first war. He served as medical officer of health and coroner in Lansdowne for many years and was past-president of the Ontario Medical Association. He was interested in sports, particularly horse-racing, football and hockey. He is survived by his widow, one son and two daughters.

Dr. G. Stuart Musgrove died on November 2, at Basrah, Iraq, as the result of a motor accident. Born in Winnipeg, in 1908, son of the late Dr. W. W. Musgrove, he graduated in Science and in Medicine (1934) from the University of Manitoba. From 1935 to 1945 he served with the R.A.M.C. in India. During most of the second world war he was stationed in Delhi, and in 1945 he was officer commanding the British Military Hospital at Singapore with the rank of Lieutenant-Colonel. After retiring from the army be began two years' postgraduate work in Winnipeg General Hospital. He completed his studies in Belfast and in London where he obtained the degree of M.R.C.O.G. Returning to Winnipeg Dr. Musgrove was associated with Dr. F. G. McGuinness for two years. In April of this year he accepted the post of specialist in Obstetrics and Gynæcology at the Maude Memorial Hospital, Basrah, at the request of the Iraq government. He is survived by his widow and one daughter.

Dr. James A. Polson, aged 64, died at Bronxville, N.Y., on November 3 after a brief illness. Born in Kingston, Dr. Polson received his early education in Kingston, entering Queen's University in 1903. After completing two years' Arts course, he transferred to the faculty of medicine and graduated in 1910. Dr. Polson interned in Seton Hospital, New York, and served on the staff of Bellevue Hospital, N.J., before establishing his own practice in Bronxville. He retired a few years ago. A member of the board of trustees of Queen's University, and an enthusiastic alumnus, Dr. Polson was also a director of N. C. Polson Co. Ltd., Montreal. Surviving are his widow and one daughter.

Dr. Austin Birrel Schinbein, aged 64, noted Vancouver surgeon and chief of surgery at Vancouver General and nearby Shaughnessy Military Hospital since 1919, died November 1 in Boston, Mass., while attending a meeting of the American College of Physicians and Surgeons. Dr. Schinbein was one of Canada's most brilliant and respected surgeons. He was made a Fellow of the American College of Physicians and Surgeons in 1917, and later became governor, vice-president and regent. He was also a Fellow of the Royal College of Surgeons of Canada. Born in Listowel, Ont., Dr. Schinbein entered medicine at University of Toronto in 1903 and was silver medalist in his graduating class four years later. He went to Hamilton General Hospital in 1907 and a year later he started private practice, specializing in surgery. He went to Vancouver in 1913. During the first world war Dr. Schinbein served overseas from 1914 to 1918 as a surgeon in the Army Medical Corps and was mentioned in dispatches by the commander of British forces at Salonika. He was awarded the O.B.E. in 1946 in recognition of his long service as a surgeon, particularly with the military. He is survived by his widow and one son, John, studying final-year medicine at University of Toronto.

Dr. Jean Paul Senecal died at St. Johns, Que., on November 14, 1950, aged 44. He studied at the College de Ste. Therese, Que., and College Ste. Marie in Montreal. He graduated in medicine from the University of Montreal in 1933. He was a member of the American Diabetic Association and a fourth degree Knight of Columbus. Surviving are his widow, a son and two daughters.

Dr. Charles Tilley Sharpe, aged 75, a former Winpeg resident, died suddenly in New York on October 27. Born in London, Ontario, he took his Arts degree at Manitoba College in 1894, and graduated from Manitoba Medical College in 1898. Before practising medicine in

Winnipeg, Dr. Sharpe had country practices at Miami and Morden, Man. He went to New York in 1910 and was first on the staff of several New York City Hospitals. Later he was physician for several Wall Street firms. In his college days, Dr. Sharpe was an outstanding soccer player. He is survived by his widow and two sons.

Dr. Robert Lorne Turnbull died on November 5, 1950, in Vancouver General Hospital. He was 70. Dr. Turnbull, was born in Atwood, Ont., attended Woodstock College and University of Toronto medical school. He came to Vancouver in 1910. He was at one time medical health officer of South Vancouver before amalgamation. He was an active member of the Terminal City Lawn Bowling Club and an elder of Canadian Memorial Church. He was also chairman of the church choir committee and a former president of A.O.T.S. Surviving are his widow and one daughter.

NEWS ITEMS

Alberta

The following certifications and fellowships have been granted by the Royal College of Physicians and Surgeons of Canada:

Certifications.—Dr. Lloyd Johnston of Lethbridge, in gynæcology and obstetrics; Dr. Lawrence A. Kickham of Westlock, in general surgery; Dr. E. A. Donald of Edmonton, in internal medicine; Dr. E. H. Duggan of the University Hospital and Dr. Rupert Clare of Edmonton, in x-ray therapy and diagnosis; Dr. E. B. Quehl, M.R.C.O.G., Dr. Douglas Ritchie and Dr. Jack Day in gynæcology and obstetrics; Dr. J. W. Duggan of Edmonton, in ophthalmology; Dr. J. Dvorkin of the University of Alberta, in internal medicine; Drs. R. A. Poirier, Louis Beauchamp, Douglas Cram and R. C. B. Corbet, in pædiatrics. Dr. Ritchie and Dr. J. W. Duggan also passed their American Boards in their specialties.

Fellowships.—Dr. Frank Hall and Dr. Hugh Farrell, formerly of Edmonton, have obtained the Fellowship in Surgery.

Dr. Morley Tuttle, F.R.C.P.[C.], formerly of Lethbridge, has been appointed the Director of Medicine for the D.V.A. at Colonel Belcher Hospital in Calgary.

Dr. Thomas Corbett, who is practising in Leduc, did Spartan work for the injured during the Leduc explosion and fire recently. We wish to congratulate Dr. Corbett for his good efforts. He is a graduate of McGill University and served in the first world war.

Dr. P. Kimmitt of Edson was another professional man who did excellent work with the injured soldiers at the recent railroad accident west of Jasper. He is a graduate of the University of Alberta.

The Alberta Society of Orthopædic Surgeons held its annual meeting in Calgary. Dr. G. Townsend who was in the chair was President during the past year. The meeting was held to discuss advances made in orthopædic surgery, several fine papers were presented by the members of which 100% were present. Dr. Graham Huckell, Professor of Orthopædic Surgery at the University of Alberta was appointed President for the coming year; Dr. Cyril Walsh of Calgary was made Vice-President and Dr. Gordon Wilson of Edmonton was elected Secretary.

W. CARLETON WHITESIDE

British Columbia

The question of hospital accommodation has been occupying a good deal of public attention just recently. It came more or less to a head in Vancouver, where at a recent meeting of the Vancouver Medical Association, some resolutions dealing with the matter were passed by the meeting, and were forwarded to the Board of Trade, and the City Council.

Plans are now in hand for a 500-bed addition to the Vancouver General Hospital, at a cost of some nine million dollars. There is a strong feeling among the majority of medical men here that this concentration of beds in one area is a mistake, and that there should be a wider distribution throughout the city, of hospitals. At present there are four hospitals situated within an area of considerably less than a square mile—the Vancouver General, Grace Hospital, Shaughnessy Hospital, and St. Vincent's Hospital. Many people feel that if there should ever be an attack on this city by aeroplanes of a foreign power, all this building might be wiped out in one single attack. We are told, however, that this has been taken into consideration by the military authorities.

There are other reasons, however, for the stand taken by the doctors. One of these is that a city of the size of Vancouver, and with regard to its special geographical characteristics, an attempt should be made to site hospitals with a view to density of population, relation to bridges, roads and waterways, and so on.

There has been considerable comment in the daily press, which on the whole, seems to agree strongly with the point of view of the doctors.

The B.C. Division of the Canadian Arthritis and Rheumatism Society is extending its system of mobile units throughout the province. It already has several of these, and the new "bluebird" cars to be provided will bring the total to nine. Clinics and mobile units will be established in New Westminster and Nelson, and a combined unit for North and West Vancouver.

The province-wide campaign for funds this year raised about $60,000. The Society received $50,000 in addition to this from the B.C. Government, to carry it on to next spring.

Of the funds received in its eighteen months of operation, 40% went to mobile units, 34% to treatment and diagnostic centres, 18% to research, and 10% to education.

A new tuberculosis hospital of some 264 beds is to be built at once in Vancouver, at a cost of about $1,500,000. This was announced recently by the Hon. A. D. Turnbull, Minister of Health and Welfare of B.C.

This will be the first unit of a larger hospital, which will ultimately house over five hundred patients. It will be of one-storey construction, and will be thoroughly in accord with all the latest ideas of this type of hospital, containing rehabilitation departments, library, auditorium, etc.

The Kinsmen's Clubs of British Columbia will begin a drive for $60,000 on January 6, 1951, to supply funds to the Canadian Foundation for Poliomyelitis, which they are sponsoring in this province. Some fifty-five committees have been set up throughout the province to handle the campaign. The object of this campaign is to secure funds for physical and economic rehabilitation of B.C. polio patients. The Kinsmen's Clubs have already done magnificent work in this connection. The establishment of the western Centre for Physical Rehabilitation in Vancouver, which is doing such important work in rehabilitation, and which has recently been greatly enlarged, owes a very great debt to this Club, and in fact could hardly have started as soon as it did, without the financial help given it by the Kinsmen.

The Lady Elizabeth Bruce Memorial Hospital at Invermere has a most active Ladies' Aid in two divisions, Senior and Junior, which work together whole-heartedly for the good of the Hospital. As is, perhaps, natural, these ladies concentrate especially on the Maternity department of the Hospital, and have provided linen, baby clothes, etc., and are now working towards the procurement of an incubator.

The Edgewater Hospital Ladies' Aid is also active in connection with the Edgewater Hospital, and are working, through individual subscriptions, and through the giving of a variety show, towards the purchase of a special sterilizer, which will cost $1,700. They are being assisted in this by the Invermere Ladies' Aid also.

J. H. MACDERMOT

Manitoba

Dr. I. O. Fryer, Winnipeg Coroner, addressed the Cosmopolitan Club luncheon on November 21, on "The Coroner's Duties in Relation to Public Service". He stated that of every five deaths in Winnipeg one is investigated by the coroner, and that falls headed the list of sudden and unexpected deaths, exceeding car accidents, industrial accidents, drowning and burns in that order.

Dr. Michael Lenczner of Bombay, India, formerly a major in the R.A.M.C., was the guest speaker at a meeting of the Alliance Francaise on November 21. He reviewed the development of India during the 150 years of British rule.

Dr. E. L. Ross, medical director of the Sanatorium Board of Manitoba, has reported a drop in the number of tuberculosis cases discovered this year, both among white persons and Indians. All persons admitted to Winnipeg hospitals and to 17 rural hospitals are now given free chest examinations at the time of admission.

A new recreation building at Manitoba Sanatorium, Ninette, was formally opened on December 2. Members of the Sanatorium Board and of the Associated Canadian Travellers who have contributed so much in the fight against tuberculosis were present.

A mobile dental clinic will be provided for rural Manitoba. It will bring dental services to 3,000 children who now cannot easily get any form of dental treatment. The clinic is made possible by a federal grant of $18,000 which will cover complete cost of equipment and the salaries of a dentist and his assistant. Travel expenses and cost of maintenance will be met by local communities.

The new 23-bed hospital at Beausejour which cost $95,000 was opened recently by Dr. E. D. Bissett. More than 150 residents of the district were present.

ROSS MITCHELL

New Brunswick

Dr. C. R. Trask, Saint John District Health Officer, was guest medical speaker, at the annual meeting of the Maritime Water Works Association, at Saint John, in October. His subject was "Various Aspects of Water Borne Diseases". He emphasized that eternal vigilance over methods of control and purification of water supplies was essential. Laxity in these measures invites disaster.

Dr. H. E. Britton, Moncton, Dr. E. Chalmers, of Fredericton and Dr. H. M. MacLean of Moncton attended the meeting of the American College of Surgeons at Boston.

As part of the educational plan of its N.B. Division of the Canadian Cancer Association, Dr. Carleton B. Peirce, Radiologist of the Royal Victoria Hospital, Montreal, has completed a tour around New Brunswick. Meetings were held at Campbellton, Bathurst, Moncton and Saint John, where large medical groups heard Dr. Peirce discuss "The early diagnosis and treatment of cancer of the uterus and breast".

Dr. Peirce was accompanied on this circuit by Dr. J. R. Nugent, chairman of the Provincial Cancer Advisory Committee; Dr. R. A. H. MacKeen, provincial pathologist, and Dr. F. L. Whitehead, secretary of the N.B. Medical Society. Many physicians from Fredericton, Sussex and Hampton, were present at the Saint John meeting, including Dr. Arthur Melanson, chief medical officer of the province.

Dr. Geo. M. White, of Saint John, attended the meeting of the Canadian Gynæcological Travel Club held in Chicago. One of the feature papers was an address on the life of the late Dr. J. Clarence Webster by Dr. Fred. Priest.

Dr. S. Allan Hooper of Moncton, received the silver acorn for distinguished service to the Boy Scout Association, at a recent investiture at Ottawa from the hands of the Chief Scout for Canada, Viscount Alexander.

Dr. V. D. Davidson, of Saint John is the new President of Saint Andrews Society. Dr. G. B. Peat is second vice-president.

Dr. D. F. W. Porter, medical superintendent, has announced that the contract for the new Moncton City Hospital, has been awarded to a Toronto firm at a cost of $2,141,744.00. The bed capacity of the new hospital will be 224, and the new building will supply a base hospital for south-eastern New Brunswick.

Dr. E. W. Lunney, and Dr. Ruth Brown, of Saint John, attended the International Congress of Anæsthetists at Miami.

Dr. J. Lenegre of Paris, delivered addresses on "Angina Pectoris" and "Œdema of the Lung" at Edmundston recently as the highlight of Doctors' day. A large number of physicians from the North-eastern portion of New Brunswick attended as well as many from that part of Quebec "au sud du fleuve".

Dr. Martin Hoffman of the research department of Dalhousie University, addressed largely attended medical meetings at St. Stephen, Edmundston, Perth, Saint John and Fredericton on a variety of subjects during the week of October 13. Dr. Hoffman, a native son of New Brunswick, spoke on Diabetes, ACTH, Electrolyte Balance and related problems.

Dr. Ernest Rommell, a veteran of both world wars has just completed a service of twelve years as ship surgeon on the cable ship *Cyrus Field*. He will reside at his old home at Havelock, N.B.

Dr. J. C. Likely, has joined the Fredericton Clinic on the eye, ear, nose and throat service.

A. S. KIRKLAND

Nova Scotia

Dalhousie Medical School held its twenty-fourth Refresher Course in October. Designed to be of particular interest to the general practitioner, the registration approached two hundred, all the Maritime provinces being represented. The Medical Faculty, with the co-operation of the Halifax hospitals, presented the work of almost all their departments in the five 9-hour days of the course. The rostrum of guest teachers was outstanding. Mr. Rodney Maingot gave the second John Stewart Memorial Lecture, "The Surgery of Peptic Ulcer". Dr. Malcolm B. Dockerty of May Clinic; Dr. Emmett Holt, Jr., New York University; Dr. Wendell Muncie, Johns Hopkins; and Dr. John Scott of the University of Alberta all made generous scientific contributions. A happy feature of the course was the adoption of the carbolic acid spray, presented by Lord Lister to Dr. John Stewart and by him to Dalhousie, as the symbol of the John Stewart Memorial Lectureship.

Plans for additions to the Halifax Children's Hospital are now almost complete and it is hoped construction will begin in the spring of '51. The new work will more than double the present bed capacity of one hundred.

The Halifax Medical Society accepted twelve new members at its last monthly meeting. Larger than the application list for some time back this welcome addition is still indicative of the rapid growth of the medical profession in Halifax since the war.

Boston, long the home of expatriate Nova Scotians, greeted a new influx when surgeons from all over the province flocked to the American College of Surgeons Annual Congress.

After seven years of dependence on distal neighbouring communities for its medical care, Isaac's Harbor has again its own physician, Dr. Ralph Sers, native of Latvia and more recently resident of England. In Isaac's Harbor Dr. Sers will serve some four hundred and fifty families, his nearest confrère being fifty miles away. To find their man the Isaac's Harbor Board of Trade had advertised in medical journals and at medical colleges across the continent without response; an advertisement in a British medical publication brought fifty applications. This is food for thought. The shortage of medical personnel in Canada is well understood. The eagerness of British doctors to seek new lands may be due to the system under which they are obliged to work rather than to any plethora at home. It is to be hoped that Dr. Sers will find many years of happiness with the people he has been chosen to serve.

ARTHUR L. MURPHY

Ontario

The Prince Albert and District Medical Society held a monthly meeting in the Avenue Hotel at Prince Albert on Monday, November 13. Dr. Chipperfield was in the Chair and Dr. Pourbaix was the new Secretary. The meeting was well attended, some twenty-two members sitting down to dinner and hearing afterwards a very excellent talk on anti-coagulants by Dr. L. B. Jaques, Professor of Physiology at the University of Saskatchewan. Dr. Jaques supplemented his talk with lantern slides.

After the scientific presentation the Registrar spoke for a few minutes in answer to some problems that had arisen in the minds of the members. Considerable interest was shown in the Group sickness and Accident Insurance policies and some advice given for the benefit of the Registrar in bringing professional problems to the Council. Following the Registrar's remarks the picture "Cancer of the Breast" was shown. This was voted the best picture that has yet been presented on the clinical diagnosis of breast cancer.

The October meeting of the Saskatoon and District Medical Society was held in the Saskatoon Club, October 24. Hosts for the evening were Drs. G. D. Blue, J. A. Boyd, M. H. Brook and A. E. Buckwold. Dr. E. R. Peterson, the President, relinquished his office to Dr. F. W. Rosher. The next executive will consist of Dr. F. W. Rosher, President; Dr. J. M. Campbell, Vice-president; and Dr. M. H. Smith-Windsor, Secretary-Treasurer. Members of the Executive Committee will be Drs. E. R. Peterson, H. D. Hart and B. A. Jackson and the Program Committee will consist of Dr. W. S. Holmes, Chairman, Dr. H. J. Anderson and Dr. E. G. Hawes.

The meeting was devoted to a discussion of problems of interest in the field of medical economics. Relationships with the Saskatoon Medical Co-op. and Medical Services Saskatoon Incorporated were dealt with and committees set up for further study of problems arising in this regard.

Dr. C. W. Forsyth who has practiced at Grenfell for the past five years has moved to Calgary and Dr. R. M. Hall, formerly of Regina, is now practicing in Edmonton.

New registrants in Saskatchewan recently are Dr. K. Goldschmied, practicing at Lucky Lake; Dr. K. Wewiorski to Arran; Dr. A. Molle practicing at Hanley; Dr. J. A. Romeyn on the staff of the Sanatorium, Fort San and Dr. J. P. Shaw on the staff of the Saskatchewan Hospital, Weyburn.

Dr. J. A. D. Paul has returned to Saskatchewan from Penticton, B.C. and has joined Drs. Chestnut and Hunter in practice at Moosomin. G. GORDON FERGUSON

Mr. Justice Roach has recommended that lung cancer be recognized in Ontario as an occupational disease of certain industries in his report of a survey of the Ontario Workmen's Compensation Act. The industries would be those in which workers are subject to the inhalation of concentrated gases from coal, tar or pitch. He mentioned evidence given at the public inquiry by Professor William Boyd who studied diseases of workers employed at a specific task at the Consumers' Gas Company, Toronto. Workers, exposed more than workers elsewhere in the plant, to coal tar gas had an incidence of lung cancer six times greater than among the male population of Ontario of the same age. Lung cancer occurred at an earlier age than in the general population. The incidence of gastro-intestinal cancer among those workers was 27.2% and of lung cancer 45.4%. Tar removed from the pipes on which the men worked produced skin cancer when applied to mice.

The Toronto Diabetes Association heard papers on Correlated Studies on the Pancreas in Diabetic and Non-Diabetic Humans at Autopsy. Dr. W. Stanley Hartroft discussed Histology and Dr. G. A. Wrenshall gave results of Insulin Content studies.

The James Franceschini Foundation has presented $25,000 to the University of Toronto. Of this, $22,500 will form the nucleus of the William Edward Gallie Trust Fund for graduate work in surgery. The remainder will pay for publication of the Gallie Volumes os Essays on Surgery. Both projects are in honour of Dr. W. E. Gallie, professor emeritus and former dean of the faculty of medicine. Interest from the trust fund will be used for fellowships or grants recommended by the head of the department of surgery. The Gallie Volume of Essays on Surgery is a compilation of surgical essays contributed by Dr. Gallie's colleagues and pupils, when he retired from the chair of surgery.

The Ontario Department of Health has leased a house on Avenue Road to be used as a Clinic for examination of alcoholics by physicians and psychiatrists. If hospitalization is required they will be sent to one of the three teaching hospitals or to the department's Erindale Hospital. A Clinic in Kingston whose work will be largely experimental will be operated in conjunction with Queen's University.

The Royal Ontario Museum's collection of silver, glass, porcelain and furniture has been enriched with the formal presentation of objects given by Mrs. F. N. G. Starr, in memory of her husband, the distinguished Toronto surgeon. Some of the best English design and workmanship is represented. More than twenty items were included in the gift. Of particular significance for a Canadian museum is the famous Wolfe tray. Inheriting the plate of General Wolfe, and finding that much of it needed repair, Admiral Sotherton had most of it made into one important tray commemorating Wolfe's North American conquest. This eventually came on the market and was bought by Dr. and Mrs. Starr with the idea that it should finally be given to the province.

At the Clinical Congress of the American College of Surgeons, Boston, Dr. J. C. Callaghan and Dr. W. G. Bigelow of Toronto gave a paper, "An Electrical Artificial Pacemaker for Standstill of the Heart". Dr. George H. A. Clowes, Jr., Dr. John Hunter and Dr. Robert W. Robertson, Toronto, gave a paper, "Experimental Exposure for Operation Upon the Mitral Valve".

In November, Dr. R. C. Smith, Toronto, addressed the Kirkland Lake Medical Society on "Common Skin Conditions". Dr. K. McAskile, Toronto, addressed the Muskoka Medical Society, Gravenhurst on Ear, Nose and Throat Conditions, Dr. D. W. G. Murray, Toronto, addressed Lincoln County Medical Society, St. Catharines on "Surgery of Congenital Heart Disease". Dr. Rex Hilton, Toronto, addressed Brant County Medical Society, Brantford on "Orthopædics". Dr. George Manning, London, addressed South Waterloo Medical Society, Galt, on "Cardiac Sclerosis".

Dr. Catherine Macfarlane of Philadelphia, under the auspices of the Canadian Cancer Society, addressed the women of Toronto on "The Message of Cancer Control". Several hundred women heard her crisp, practical talk and saw a movie dealing with the topic of self-examination of the breast.

LILLIAN A. CHASE

Quebec

Founded in 1938, by Professor Armand Frappier, the Institute of Microbiology and Hygiene of the University of Montreal is considered as of the French School of Microbiology in North America. Furthermore, it is a development of the B.C.G. Laboratory of the University of Montreal, which, since 1926, has been a pioneer of the antituberculosis vaccination, on a continent that was, at that time, hostile or, to say the least, apathetic.

A "Research Day" on October 28, 1950 commemorated the twelfth anniversary of the foundation of the Institute. It was an occasion for more than 300 representatives of Federal and Provincial Health or Research Organisms, scholars, scientists and medical men, to get together. Dr. J. H. A. Paquette, Minister of Health of the Province of Quebec, and Honorary President of the Institute, favoured the "Research Day" with his presence. Many international personalities were also present: Dr. Léopold Nègre, from the Institut Pasteur of Paris; Professor Pierre Lépine, Head of the Virus Service, at the Institut Pasteur de Paris, and Professor Henry Simonnet, from the National Veterinary School at Alfort, France, and the National Institute of Agronomy, Paris.

Following the visit of the Institute and of the research exhibits in the different services, where scientific equipment had been recently completed by the installation of an electron microscope, the guests attended a lecture, given by Dr. L. Nègre, entitled: "Properties of the tubercle bacillus at its different biological ages". During the afternoon, a synopsis was given on the general organization and operations of the Institute and its six departments.

"The Research Day" was closed by a reception offered by the Director of the Institute, in the "Hall d'Honneur" of the University of Montreal, and by a banquet to the official representatives, offered by the President and the Members of the Board of Administration of the Institute.

The appointment of Dr. John H. Laurie as Manager of the Medical Department of Merck & Co. Limited has been announced in Montreal. Dr. Laurie was formerly with the Nova Scotia Department of Health where he served as medical superintendent and Clinical Director of a large hospital.

The opening on Saturday, December 2, 1950 of the New Barrie Memorial Hospital at Ormstown, Quebec, was a significant event in hospital development in the Province. Not a very large institution, (it has 60 beds and 14 bassinets), it is evidence of a constant faith and effort which may well help in the growth of similar institutions in other parts of the province. The notable feature of the hospital is its close association with the partnership of two of the leading practitioners of Ormstown, Drs. Murray Stalker and T. J. Quintin, and later with the group practice of the Ormstown Medical Centre.

This is in truth a community general hospital, equipped and staffed to provide the specialized attention of a modern hospital. Any licensed practitioner in the counties of Châteauguay and Huntingdon may be appointed to the medical staff by the hospital's Board of Management and thus be entitled to look after his patients in hospital. An unusual and most valuable feature of the hospital is that it has an intern to help with the patients and keep medical records.

This hospital will go far to help in the development of the best type of country practice and in providing medical care for a large district.

A sa réunion annuelle, l'Association des Radiologistes de la province de Québec a procédé à l'élection de son Exécutif pour l'année 1951. Président: Dr Edwin M. Crawford, Hôpital Homéopathique, Montréal. Vice-président: Dr Origène Dufresne, directeur médical et scientifique de l'Institut du Radium, Montréal. Secrétaire: Dr Guillaume Gill, Institut du Radium, Montréal. Trésorier: Dr Donald M. McRae, Institut Neurologique, Montréal. Directeurs: Dr Mathieu Samson, de l'Hôpital St-Michel-Archange, Québec, Dr Jules Gosselin, Hôpital du St-Sacrement, Québec, Dr Carleton B. Pierce, de l'Hôpital Royal Victoria, Montréal, Dr. L. A. Gagnier, de l'Hôpital St-Jean-de-Dieu, Montréal, Dr E. F. Crutchlow, de l'Hôtel-Dieu, Montréal. Le Dr Jean-Pierre Jean de l'Hôtel-Dieu de Montréal, a été nommé secrétaire des séances.

Grâce à une subvention du gouvernement fédéral, se chiffrant à $55,300 pour l'année courante, une clinique modèle a été créée à l'Hôpital Ste-Justine de Montréal, pour fournir aux mères et aux bébés des soins prénatals, natals et post-natals. Le personnel comprendra un pédiâtre, une infirmière et une technicienne à temps complet; un obstétricien et un psychiâtre y feront du service intermittent, et deux infirmières appliqueront un programme de visites à domicile. Le dispensaire sera pouvu d'un appareil à Rayons X et de 10 incubateurs. Une ambulance de construction spéciale pouvant contenir quatre incubateurs servira à transporter à l'hôpital les bébés prématurés. On s'attend que cent personnes environ se présentent chaque semaine à la clinique, et que les infirmières fassent quarante visites à domicile.

La Société Canadienne d'Arthrite et du Rheumatisme annonce que pour la deuxième année consécutive des bourses d'études, variant de $3,000 à $4,000, seront données aux trois médecins présentement en études hautement spécialisées aux Etats-Unis et en Angleterre. Ces jeunes médecins sont les Drs Joseph A. Blais, de Guise Vaillancourt, et Roger Demers, tous trois de Montréal.

A. SEGUIN

General

The Thirteenth British Congress of Obstetrics and Gynæcology will be held at Leeds, Yorkshire, on July 8 to 11, 1952. The subjects for discussion are: Abnormal Uterine Action in Labour; Stress Incontinence of Urine; the Place of the Pædiatrician in a Maternity Unit; Genital Tuberculosis in the Female. All communications relating to this Congress should be addressed to the Secretary: B. L. Jeaffreson, M.D., F.R.C.S., F.R.C.O.G., 32, Park Square, Leeds, 1, England.

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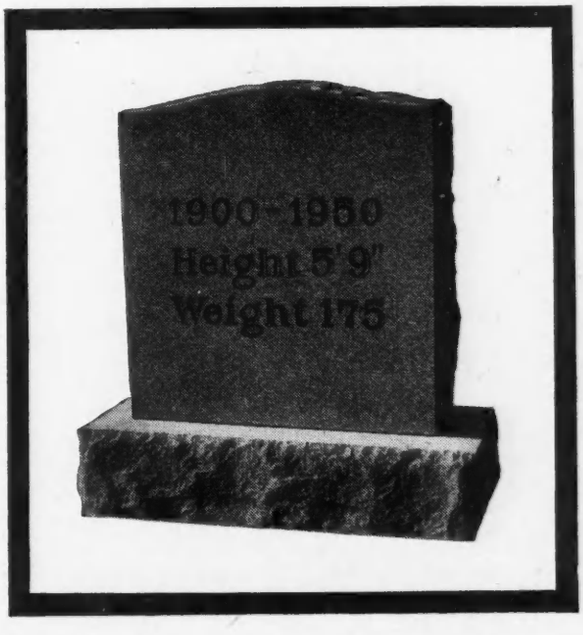

*T.M. Reg. Can. Pat. Off.

Postgraduate Medical Studies in Britain. — Dr. Julian Landman of London, a leading authority on postgraduate medical education in Britain will be in Canada during January, 1951. His address will be—Royal York Hotel, Toronto. Canadian doctors who are contemplating coming to Britain for postgraduate studies are advised to contact Dr. Landman, who will gladly give personal advice and information on all matters connected with postgraduate medical study in Britain.

The Canadian Urological Society will hold their annual meeting in Mont Tremblant, Que., on June 18, 19 and 20. Further announcements will appear in the Journal.

Book Reviews

Postgraduate Gastroenterology. Edited by H. L. Bockus. 670 pp., illust. $11.50. W. B. Saunders Co., Philadelphia; McAinsh & Co., Toronto, 1950.

This excellent book is the written record of a course in gastroenterology arranged by the American College of Physicians under the chairmanship of Professor Bockus. It is an intensive review of the highlights in recent advances and ideas in the field of gastroenterology. It was presented to internists especially interested in this field. The course and discussions were carried out at a high level of rapport. One might suggest that the average physician would be lost in the depth and scope of the various problems discussed. If this be a fault it is a good one. Experimental, physiological, biochemical and pathological aspects of the topics are covered. Since these are discussed by clinicians, surgeons, radiologists, physiologists and laboratory workers, the wealth of the material unfolded is tremendous. In addition to specific topics, panel discussions were also held. It is here that one gleans the intimate "pearls" in differential diagnosis and clinical acumen. One feels certain that this book will be widely referred to by practising specialists.

Clinical Neurology. B. J. Alpers, Professer of Neurology, Jefferson Medical College, Philadelphia. 846 pp., illust., 2nd ed. $12.50. F. A. Davis Co., Philadelphia; The Ryerson Press, Toronto, 1949.

This textbook is now in its second edition. It covers the subject well, and should be a useful text for students. It is difficult to understand why no bibliography is given. A textbook often provides the stepping stone for further study of the literature and references to leading articles are always welcome. The illustrations are well selected. Apart from the absence of a bibliography, it is a good textbook, and should prove popular with students.

Handbook of Surgical Urology for Interns, Hospital Corpsmen and Nurses. N. F. Ockerblad, Professor of Clinical Urology, University of Kansas School of Medicine. 189 pp., illust. $3.00. The Williams & Wilkins Co., Baltimore, 1949.

This little book is an effort to instruct interns and nurses. It contains several excellent chapters notably those on methods of Urological Diagnosis, Technical and Therapeutic Procedures and the care of Urological Instruments. The brevity enforced on the author by the size of the volume and the wide field he attempts to cover prevent thorough exposition and detailed instruction. This lack of concentration on practical teaching robs the text of some of its value. Several chapters, notably those on the History of Urology, Urology in Children and complications of Pregnancy contain little that will help a nurse or intern care for a patient, the general aspects of such subjects are better covered in larger volumes.

Urological Surgery. A. I. Dodson. 855 pp., illust., 2nd ed. $15.00. C. V. Mosby Co., St. Louis, Mo.; McAinsh & Co. Ltd., Toronto, 1950.

This book was intended originally to be a text of surgical treatment only. The author however thought it advisable to include additional explanatory material concerning the pathology and symptomatology of various lesions. The value of the text has thereby been enhanced. The additional material will prove particularly useful for the surgeon who is compelled occasionally by circumstances to do urological operations. All the commoner urological procedures are clearly described and adequately illustrated. Alternative techniques are presented without prejudice. There are twelve collaborating authors who contribute six of the introductory seven chapters but only a small part of the remainder of the book. All of the topics covered by these collaborators are of a highly specialized nature, such as acidbase balance, shock, anæsthesia, radiation therapy, etc. In the later part of the book tuberculosis is discussed by T. Leon Howard, neurogenic disease of the bladder by James H. Semans, injuries to the urinary tract by Geo. C. Prather and endocrinology by Linwood D. Keyser. The book can be recommended to all those who are interested in urological surgery.

Urologic Roentgenology. M. B. Wesson, Past President, American Urological Association. 282 pp., illust., 3rd ed. $9.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

The author has revised and written this whole book, having amplified many sections and added many new illustrations both supplementary and as replacements. The bibliography has also been brought up to date. This improved and modernized text covers radiographically all of the commoner urologic conditions, and should continue to find favour with students and practitioners interested in radiologic diagnosis in urology.

Radiographic Atlas of Skeletal Development of the Hand and Wrist. W. W. Greulich, Professor of Anatomy, Stanford University School of Medicine, and S. Idell Pyle, Research Associate, Brush Foundation and Department of Anatomy, Western Reserve University School of Medicine. 190 pp., illust. $10.00. Stanford University Press, 1950.

This book is based on material collected and compiled by the Brush Foundation Study, organized by the late Professor T. Wingate Todd. The data resulted from the examination at set intervals from birth to maturity of 1,000 healthy white children of European ancestry. The Atlas is arranged in three parts, the first two composed of radiographs of the hands and wrists of both sexes from birth to maturity. The third part is a series of line drawings of the epiphyses of the hand and wrist at all their growth stages from first appearance to fusion with the diaphyses. The drawings are accompanied by short notes explaining their use as maturity indicators. The X-ray reproductions in the original negative are excellent. The line drawings are simple and self-explanatory.

Textbook of Healthful Living. H. S. Diehl, Professor of Preventive Medicine and Public Health, and Dean of the Medical Sciences, University of Minnesota; Director, Health Studies, American Youth Commission; former member, National Advisory Health Council, United States Public Health Service; Member, Governing Council, American Public Health Association, former President, American Student Health Association. 776 pp., illust., 4th ed. $4.85. McGraw-Hill Book Co., Inc., New York, Toronto and London, 1950.

This book was originally written to provide the general reader with information concerning the preservation and improvement of health. It was revised in the second edition as a textbook in personal hygiene for college students. The rapid advances in medical science, preventive medicine and public health have necessitated a fourth edition. As the material presented closely

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resembles that found in medical textbooks on Hygiene and Preventive Medicine, this book will not be of interest to the medical profession. For the college student or general reader the proportion of the text devoted to the description of disease and dying is so greatly in excess of that dealing with health and living that its use cannot be recommended.

Psychosomatic Medicine. Its Principles and Applications. F. Alexander. Director, Chicago Institute for Psychoanalysis, Clinical Professor of Psychiatry, University of Illinois. 300 pp. $4.00. W. W. Norton & Co., Inc., New York, 1950.

This book presents a brief and readable account of psychosomatic medicine from the psychoanalyst's point of view. The author proposes two laudable principles in the preparation of his material—first, "psychological factors influencing psychological processes must be subjected to the same detailed and careful scrutiny as is customary in the study of physiological processes", and, second, "psychological processes are fundamentally not different from other processes which take place in the organism, differing from other body processes only in that they are perceived subjectively and can be communicated verbally to others". All will agree that the application of these principles is a worthy ultimate aim, attaining partial success at the present time due to the relatively undeveloped state of psychology as a science.

The book is divided into two parts. Part 1, dealing with general principles, relates briefly the development of psychosomatic medicine, the relationship of psychological processes to the subject matter of neurology and endocrinology and the fundamental principles of the psychosomatic approach. Part 2 deals with specific diseases of the gastrointestinal, respiratory and cardiovascular system, and disturbances of the skin, endocrine glands, joints and muscles. A chapter prepared by Dr. Therese Benedek on disorders of sexual function is included. The book ends with a particularly restrained and sound chapter on therapy. The specialized vocabulary of the psychoanalyst has been wisely minimized, rendering the material intelligible to the general medical reader. Few will disagree with the basic principles set forth, though many will be unimpressed by the psychoanalytical interpretation placed on some of the individual cases used as examples. This book may be recommended as an up-to-date presentation of the subject as interpreted by a psychoanalyst, to be read with an open, yet critical, mind.

The Management of the Patient with Severe Bronchial Asthma. M. S. Segal, Assistant Professor in Medicine, Tufts College Medical School. 158 pp., illust. $4.50. Charles C. Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1950.

This book provides a valuable addition to the library of almost any practising physician. The title rather suggests its greatest value might be to those specializing in Internal Medicine and diseases of the lungs. On the contrary, it should prove helpful to all who are called upon to treat asthmatic patients, in any degree of severity of their paroxysms. It is clear, brief, concise, and authoritative. The text chiefly presents the practical management of the problem of the asthmatic patient as encountered in practise, with just enough experimental and physiological background to explain the rationale of common therapeutic procedures.

Gynècologie et Maladies du Sein. M. Robey, A. Tailhefer, J. Thoyer-Rozat. 490 pp., illust. Les Traitès Du Praticien, 18 Rue de l'Universitè, Paris, 1950.

This is one book of a series of 18 specially published for the benefit of the general practitioner under the name "Collection les Traités du Praticien". It deals with gynæcology in a rather concise manner except perhaps for the chapters on the physiological aspect of women's diseases. It does not enter into the discussions or the experimental stages of research and takes a stand on some points which in our opinion are debatable, especially considering that the publication is dated 1948. The first part deals with the anomalies of the anatomy; the second part with the anomalies of the physiology; the third part with the anomalies of the function of reproduction; the fourth part on the syndromes of tumours; the fifth part on the dystrophic syndromes; the sixth part on the infectious syndromes and the seventh part on the diseases of the breast. The practitioner and the medical student will find a comprehensive résumé of the principal diseases which are to be encountered in a general practice. A foreword by the late Professeur L. Portes, gives to this book an official recognition of its value.

Medical Jurisprudence and Toxicology. J. Glaister, Regius Professor of Forensic Medicine, University of Glasgow. 755 pp., ill., 9th ed. $6.75. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada Ltd., Toronto, 1950.

This standard textbook, which was awarded the Swiney prize in 1949 by the Royal Society of Arts for the best published work on Medical Jurisprudence has now reached the ninth edition. Although much of this new material is of special interest to English doctors, it is still an authority for Canadian Medical Jurisprudence. More recent legal cases have been added to exemplify various aspects. New illustrations have been included; many of these are coloured. Among new subjects added are the Medico-legal aspects of Artificial Insemination, Rh subtypes, the effects of Blast and the Atomic Bomb and under Toxicology; D.D.T., Benzedrine Sulphate, Beryllium and Radio-active substances. It is an exhaustive work in which all necessary information has been packed into as small space as possible.

The Mask of Sanity. H. Cleckly, Professor of Psychiatry and Neurology, University of Georgia School of Medicine, Augusta, Georgia. 569 pp., 2nd ed. $7.50. C. V. Mosby Co., St. Louis, Mo.; McAinsh & Co. Ltd., Toronto, 1950.

This book is an ambitious attempt to make order out of the chaos that is "psychopathic personality". It is well written and interesting and should be read by all those who have to do with the investigation and management of psychiatric patients. Psychopathic personality has always been a sort of wastepaper basket diagnostic entity. It seems however that the author of this volume has rather filled than emptied the basket. It is not at all clear just what his criteria of psychopathic personality are and one would gather that he has enlarged rather than decreased the number of patients who should be diagnosed as psychopathic personalities. In a number of places, the author refers to "typical" patients or patients "in our group", yet the reader is rather at a loss to realize exactly what "typical" is supposed to indicate. The author takes a broad attitude towards an explanation of the factors which cause people to become psychopaths. He takes into account the various psychodynamic theories along Freudian lines, neural mechanisms based on Sherrington's work and semantic factors based largely on Korzybski's contributions. He is inclined to regard psychopathic personality as "semantic disorder", paralleling the term of Head's concept of semantic aphasia. The book written in a rather rambling fashion without sufficient sifting of the vast amount of material presented. The literary style is excellent.

Speech Therapy for the Physically Handicapped. S. S. Hawk, Associated Colleges at Claremont. 245 pp., illust. $4.00. Stanford University Press, Stanford, California, 1950.

Dr. Hawk's writing is directed to those interested in the physically handicapped child and part of the therapy is at variance with normal speech procedures. In the orthopædic hospital, Dr. Hawk augments periods given to speech with physiotherapy. This innovation is interesting but the reviewer does not feel that such a procedure is within the scope of the well-trained speech clinician, nor that physiotherapy is better served by such treatment. For the student, whether concerned with speech, social work or medicine, there is little in the book that is not stated better in any number of standard texts in speech correction.

Continued on page 44

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Books Received

Continued from page 94

Books are acknowledged as received, but in some cases reviews will also be made in later issues.

Tuberculosis and Other Problems of Pædiatrics. A. Wallgren, Professor of Pædiatrics, The Royal Caroline Medical Institute, Stockholm, Sweden. The Abraham Flexner Series Number Ten. 108 pp. $2.50. The Williams & Wilkins Co., Baltimore; Burns & MacEachern Toronto, 1950.

Facial Paralysis, A Treatise on a Clinical Classification of Paralysis of the Facial Nerve. J. P. Findlay, Honorary Assistant Aural Surgeon, Sydney Hospital. 47 pp., illust. 17/6. Angus & Robertson Ltd., Sydney, Australia, 1950.

Postgraduate Gastroenterology. Edited by H. L. Bockus. 670 pp., illust. $11.50. W. B. Saunders Co., Philadelphia; McAinsh & Co. Ltd., Toronto, 1950.

The Pathology of Internal Diseases. W. Boyd, Professor of Pathology and Bacteriology in the University of Toronto, Toronto. 866 pp., illust., 5th ed. $13.20. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

The Closed Treatment of Common Fractures. J. Charnley, Assistant Honorary Orthopædic Surgeon, Manchester Royal Infirmary; Visiting Orthopædic Surgeon, The Park Hospital, Davyhulme. 190 pp., illust. $6.75. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1950.

Medicinal and Food Plants of British Columbia. I. B. Hudson. 70 pp., illust. $1.50. Published by the Author. Quality Press, Victoria, 1950.

Eye Surgery. H. B. Stallard, Surgeon, The Moorfields Eye Hospital; Eye Surgeon, St. Bartholomew's Hospital. 667 pp., illust., 2nd ed. $10.00. John Wright & Sons Ltd., Bristol; Simpkin Marshall Ltd., London; Macmillan Co. of Canada Ltd., Toronto, 1950.

The Meaning and Practice of Psychotherapy. V. E. Fisher, Psychologist and Psychotherapist, formerly: Assistant Psychologist, Worcester State Hospital; Assistant Professor of Psychology and Director of the Mental Clinic, New York University, Washington Square College. 411 pp. $5.00. Macmillan Co. of Canada, Toronto, 1950.

A Textbook of Histology, Functional Significance of Cells and Intercellular Substances. E. V. Cowdry, Professor of Anatomy, The School of Medicine, Washington University, St. Louis, Mo. 640 pp., illust., 4th ed. $10.20. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

Pneumoconiosis Beryllium, Bauxite Fumes, Compensation. Edited by A. J. Vorwald, Director of the Trudeau Foundation and The Saranac Laboratory with the collaboration of M. Bowditch, T. M. Durkan, T. C. Waters. Leroy U. Gardner Memorial Volume. 659 pp., illust. $7.50. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1950.

Continued on page 68

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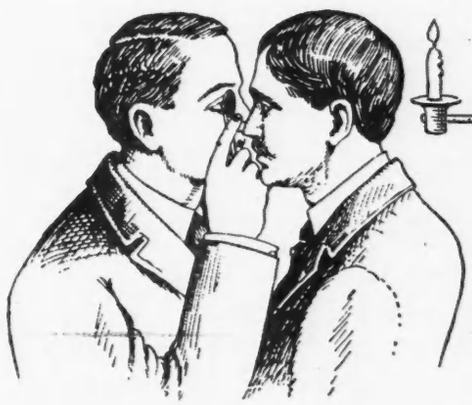
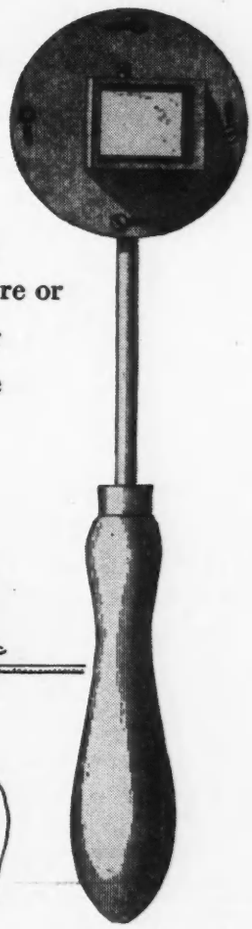


Reproduced from an early drawing showing the ophthalmoscope in use.



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Books Received

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Carbon Dioxide Therapy, A Neurophysiological Treatment of Nervous Disorders. L. J. Meduna, Professor of Psychiatry, University of Illinois, College of Medicine, Chicago, Illinois. 236 pp. $5.00. Charles C. Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1950.

Canadian Income Tax Act, 16th Edition, Consolidated to and including 1950 with 2-way Cross Reference Table to Old and New Acts. 329 pp. $2.50. CCH Canadian Ltd., Publishers of Topical Law Reports.

Transactions of the American Goitre Association, 1949 Annual Session. 460 pp., illust. Charles C. Thomas, Springfield, Illinois.

The Management of Obstetric Difficulties. P. Titus, Obstetrician and Gynæcologist, St. Margaret Memorial Hospital, Pittsburgh; Consulting Obstetrician and Gynæcologist to the Shadyside Hospital, Pittsburgh. 1,046 pp., illust., 4th ed. $16.00. The C. V. Mosby Co.; McAinsh & Co. Ltd., Toronto, 1950.

Cytology of the Human Vagina. I. L. C. De Allende, Chief of the Division of Endocrinology, Mercedes and Martin Ferreyra Institute of Medical Investigation and O. Orias, Director, Mercedes and Martin Ferreyra Institute of Medical Investigation, Cordoba, Argentina. 286 pp., illust. $7.50. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1950.

Freud: Dictionary of Psychoanalysis. Edited by N. Fodor, Associate for the Association for the Advancement of Psychotherapy and F. Gaynor. 208 pp. $3.75. Philosophical Library, New York, 1950.

Problems of Infancy and Childhood. Transactions of the Third Conference, March 7-8, 1949. Edited by M. J. E. Senn, Departments of Pædiatrics and Psychiatry, Yale University of Medicine. 156 pp. $1.25. Published by the Josiah Macy, Jr. Foundation, New York, 1949.

Factors Regulating Blood Pressure. Transactions of the Third Conference, May 5-6, 1949. Edited by B. W. Zweifach and E. Shorr, Department of Medicine, Cornell University Medical College. 208 pp., illust. $2.55. Published by the Josiah Macy, Jr. Foundation, New York, 1950.

Methods of Tissue Culture. R. C. Parker, Research Associate, Connaught Medical Research Laboratories, and Associate Professor of Experimental Cytology, School of Hygiene, University of Toronto, with a chapter by J. F. Morgan, Research Associate, Connaught Medical Research Laboratories, University of Toronto. 294 pp., illust., 2nd ed. $7.50. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1950.

Facts of Life and Love for Teenagers. E. M. Duvall, Consultant, National Council on Family Relations. 360 pp., illust. $3.85. Association Press, New York, 1950.

Private Companies Special Tax on Undistributed Income. K. LeM. Carter and J. L. Stewart. 61 pp. $2.00. CCH Canadian Ltd., Toronto and Montreal, 1950.

Hay-fever—A Key to the Allergic Disorders. J. Freeman. 321 pp., illust. 42s. net. William Heinemann Medical Books Ltd., London, 1950.

The 1950 Year Book of Medicine. Edited by P. B. Beeson, J. B. Amberson, etc. 819 pp., illust. $5.00. The Year Book Publishers Inc., Chicago, Ill., 1950.

Endometriosis. C. Fernandez-Ruiz, Professor Adjunto de Ginecologia de la Facultad de Valladolid. 235 pp. Precio 25 Pestas. Ediciones B Y P, Calle Calabria, 66 al 76, Barcelona, 1950.

Renal Diseases. E. T. Bell, Professor of Pathology in the University of Minnesota. 448 pp., illust. 2nd ed. $9.60. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

Coronary Circulation in Health and Disease. D. E. Gregg, Chief Research Physician, Medical Department, Field Research Laboratory, Fort Knox, Kentucky. 227 pp., illust. $5.40. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1950.

Elements of Human Physiology. M. S. Lucas, Assistant Professor, Department of Biological Science, Michigan State College. 357 pp., illust., 2nd ed. $5.70. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1950.

Emergencies in Medical Practice. C. A. Birch, Physician, Chase Farm Hospital, Enfield. 564 pp., illust., 2nd ed. $5.25. C. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada Ltd., Toronto, 1950.

A Symposium on Steroid Hormones. Edited by E. S. Gordon. 396 pp., illust. $8.50. The University of Wisconsin Press; Burns & MacEachern, Toronto, 1950.

Textbook of Abnormal Psychology. R. M. Dorcus, Professor of Psychology, Division Dean of Life Sciences, University of California. G. W. Shaffer, Dean of University, Professor of Psychology, Director of Psychological Clinic, Johns Hopkins University. 717 pp., illust., 4th ed. $5.75. The Williams & Wilkins Co., Baltimore; Burns & MacEachern, Toronto, 1950.

Practical Biology for Medical and Intermediate Students. C. J. Wallis, Principal, Eaton and Wallis, Tutors. Formerly Master-in-charge of Biology, University College School and Biology Master, Highgate School. 404 pp., illust., 3rd ed. 21s. William Heinemann Medical Books Ltd., London, 1950.